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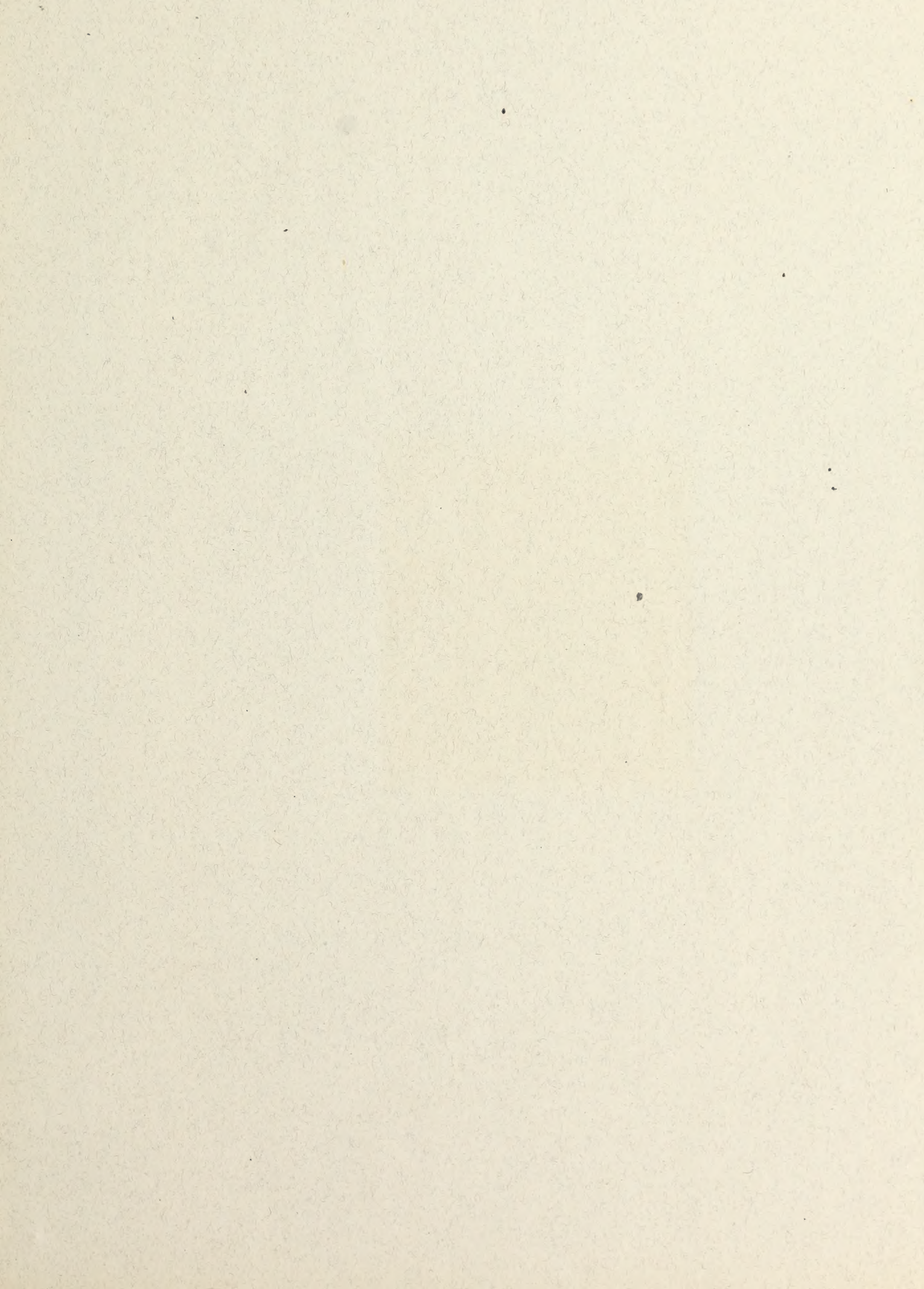
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Orthoptera

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GENERA INSECTORUM

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P. WYTSMAN

ORTHOPTERA

FAM. MANTIDÆ

SUBFAM. VATINÆ

by JAMES A. G. REHN

WITH 1 COLORED PLATE

1911

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12,58457, July 10

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THE Vatinæ is a heterogeneous group of Soothsayers or Mantids primarily characterized by having the anterior tibiæ with the external margin spinulose, the internal margin of the anterior femora with equal or biseriate spines, and the posterior tibiæ and femora more or less carinate (1). The subfamily comprises twenty-eight genera and one hundred and three species, roughly divisable into six sections. Many of the species are very rare, in fact a number of the genera are known only from unique specimens, while the proportion of genera with more than four species are few, the only genera containing a considerable number of species being *Stagmatoptera* and *Vates*.

Geographical distribution. — In distribution the Vatinæ cover the greater portion of the Tropical and Subtropical regions of the earth. In the Neotropical region they range practically over its entire area, extending north of it as far as Arizona and Texas, and extending south in it as far as the northern portion of Argentina. In Africa the group ranges from Algeria to Cape Colony, and in the Oriental region it ranges from the Himalayan subregion to Ceylon, while a single species has been doubtfully recorded from Australia.

Systematic position. — It seems the closest relationship of the Vatinæ is with the Creobotrinæ, a group almost co-extensive in distribution with the former, although of greater range in the Oriental region. Certain of the American genera, however, show apparently decided tendencies toward the

(1) This latter character is not absolute, the male of *Cardioptera* being an exception. It is poorly indicated in several other genera.

Mantinae and the true position in a linear arrangement should be intermediate between the Mantinae and Creobotrinae. No close relationship appears to exist to any of the other subfamilies of the Mantidae.

Stål, in 1877, first established and defined this subfamily in the sense that we understand it to-day, while Brunner von Wattenwyl, in 1893, gave us a key for the differentiation of the genera, although we have found it necessary to recast the whole arrangement, the table here given being entirely new.

Characters. — Body robust, elongate or decidedly bacilliform. Eyes globose, acuminate or mammilliform. Occiput rounded or lobate. Antennae simple, serrate or pectinate. Pronotum with supracoxal dilation slightly or decidedly marked. Organs of flight fully developed or abbreviate. Anterior tibiae with external margin spinulose. Anterior femora with internal margin with equal or biseriate spines. Posterior tibiae always (1) and the posterior femora usually carinate dorsally. Cerci terete, foliaceous lamellate or moniliform. Limbs frequently and abdomen more rarely lobate.

The Vatinae lends itself into a group division of six parts as follows :

CARDIOPTERÆ . . .	<i>Cardioptera.</i>				<i>Heterochæta.</i>
	<i>Oxyopsis.</i>				<i>Pseudochæta.</i>
	<i>Pseudoxyops.</i>				<i>Severinia.</i>
	<i>Paroxyopsis.</i>		HETEROCHÆTÆ . .		<i>Heterochætula.</i>
	<i>Parastagmatoptera.</i>				<i>Paradanuria.</i>
STAGMATOPTERÆ .	<i>Lobocneme.</i>				<i>Euthyphleps.</i>
	<i>Leptococe.</i>				<i>Æthalochroa.</i>
	<i>Stagmatoptera.</i>				<i>Macrodanuria.</i>
	<i>Heterovates.</i>				<i>Danuria.</i>
	<i>Zoolea.</i>		POPÆ		<i>Danuriodes.</i>
VATIDES	<i>Vates.</i>				<i>Popa.</i>
	<i>Hagiotata.</i>				<i>Danuriella.</i>
	<i>Phyllovates.</i>				<i>Phitrus.</i>
PSEUDEMPUSÆ . .	<i>Pseudempusa.</i>		JALLÆ		<i>Jalla.</i>

Where minor genera groups appear to be present we have indicated them by secondary brackets. The Cardiopteræ and Vatides are entirely Neogæan, the Popæ and Jallæ almost entirely African, one species alone being Oriental, the Stagmatoptera chiefly Neotropical with but four African species occurring outside that region, while the Heterochætæ falls into two sections, the first of which is African and the second Oriental.

KEY TO THE GENERA

1. Occiput never lobate. Eyes never mammilliform (acute or sub-acute in *Oxyopsis* and *Pseudoxyops*). Anterior coxae not produced into a distinct lamellate expansion at the distal extremity of the anterior margin.
2. Vertex smooth, without distinct paired processes. Wings of female frequently flavo-tessellate. Tibiæ never lobate.
3. Anterior femora with three discoidal spines. Median

(1) Except in male of *Cardioptera*.

and posterior tibiae of the male terete, entire median limbs of male strongly pilose

1. GENUS *CARDIOPTERA*, Burmeister.

- 3.3. *Anterior femora with four discoidal spines. Median and posterior tibiae of both sexes more or less distinctly carinate, not strongly pilose.*

4. *Tegmina of female entirely greenish or with stigma maculate or ocellate. Femora not lobed (except in Lobocneme). Head flattened anteriorly.*

5. *Eyes laterally acute or produced. Tegmina of female elongate, subequal. Ulnar vein of wing simple or furcate. Antennae setaceous.*

6. *Eyes produced with the apices acute or subacuminate. Costal field of tegmina broad, at least two-fifths the entire width of tegmen, with distinct oblique veins. Posterior femora without apical lobe.*

7. *Eyes with apices acute. Costal field of female tegmina with veins disposed more longitudinal than transverse. Ulnar vein of wing furcate. Pronotum of female with margins decidedly serrate*

2. GENUS *OXYOPSIS*, Caudell.

- 7.7. *Eyes subacuminate. Costal field of female tegmina with veins disposed more transverse than longitudinal. Ulnar vein of wing simple. Pronotum of female with margins hardly serrate*

4. GENUS *PSEUDOXYPIS*, Saussure & Zehntner.

- 6.6. *Eyes produced but with apices rounded. Costal field of tegmina narrow, one-third to one-fourth the entire width of tegmen, dense-reticulate and with no oblique veins. Posterior femora with a small lobe at apex of inferior carina*

3. GENUS *PAROXYOPSIS*, nov. gen.

- 5.5. *Eyes rotundate. Tegmina of female broad, ovate. Ulnar vein of wing ramose. Antennae setaceous or serrulate.*

6. *Tegmina of female moderately broad; costal margin subexcised at the apex (except in Lobocneme). Antennae of male serrulate.*

7. *Supracoxal lobes of female pronotum slightly or moderately dilated. Costal field of female tegmina hardly or moderately dilated. Median and posterior femora without preapical lobes.*

8. *Costal field of female tegmina moderately dilated, about one-third the entire tegminal width, narrowing in distal half.*

- Pronotum distinctly shorter than the tegmina.* 5. Genus PARASTAGMATOPTERA, Saussure.
- 8.8. *Costal field of female tegmina hardly dilated, not more than one-fourth the entire tegminal width, hardly narrowing distally. Pronotum (of female) subequal to the tegmina in length.* 7. Genus LEPTOCOCE, nov. gen.
- 7.7. *Supracoxal lobes of female pronotum strongly dilated. Costal field of female tegmina strongly dilated, about two-fifths the entire tegminal width, narrowed only in apical third. Median and posterior femora each with a rounded preapical lobe on the posterior ventral carina.* 6. Genus LOBOCNEME, nov. gen.
- 6.6. *Tegmina of female cordiform, very broad with costal margin considerably dilated, or elliptical. Antennae of male setaceous.* 8. Genus STAGMATOPTERA, Burmeister.
- 4.4. *Tegmina of female fusco-maculate. Median and posterior femora lobed. Head anteriorly excavate.* 9. Genus HETEROVATES, Saussure.
- 2.2. *Vertex above ocelli bilobulate or bicornate. Antennae of male more or less serrate or pinnate. Tegmina frequently fusco-maculate. Wings of female never flavo-tessellate, frequently fusco-purpurent. Median and posterior tibiae strongly carinate or foliate.*
3. *Limbs lobate; anterior femora with an apical dorsal lobe. Abdomen of female lobate. Antennae of male setaceous, serrulate. Tegmina subacuminate; costal field of female narrow.* 10. Genus ZOOLEA, Serville.
- 3.3. *Anterior femora not lobate. Antennae of male heavier, serrate.*
4. *Limbs not lobate, distinctly multi-carinate.*
5. *Tegmina of female with apex acuminate; costal field parallel or dilated toward apex, where it is more or less strongly excised or at least narrowed. Tegmina green, fusco-maculate. Pronotum elongate, rather smooth or little granulate. Abdomen not lobate. Posterior tibiae curved. Antennae of male internally serrate, submoniliform.* 11. Genus PHYLLOVATES, Kirby.
- 5.5. *Tegmina of female fulvo-griseous, maculose; apex attenuate, rounded; costal field very narrow, toward apex gradually attenuate, not excised. Pronotum elongate, considerably granulate. Abdomen lobate. (Male unknown.)* 12. Genus HAGIOTATA, Saussure & Zehntner.
- 4.4. *Median and posterior limbs lobate. (Female abdo-*

- men lobate or entire. Antennae of male pectinate internally. Tegmina of female rotundate at the apex; costal field subparallel, apex more or less excised.*) 13. Genus VATES, Burmeister.
- 1.1. Occiput with one or more pairs of lobes or lobules, or where these are lacking the eyes are mammilliform, or the anterior coxae have the distal portion of anterior margin developed into a lamellate expansion, or the wing has a large ocelliform spot (Pseudempusa).
2. Pronotum elongate, at least three times as long as greatest width. (Limbs with or without lobes. Occiput with or without postocular tubercles.) 2. Genus PSEUDEMPUSA, Brunner von Wattenwyl.
3. Wings with large ocelliform spot. Supracoxal dilation large, triangularly produced. (Limbs not lobate; occiput subtruncate, not lobate; cerci terete.) 2. Genus PSEUDEMPUSA, Brunner von Wattenwyl.
- 3.3. Wings without ocelliform spot. Supracoxal dilation slightly or roundly produced (except in *Popa* where it is triangularly produced).
4. Cerci lamellate, foliaceous.
5. Occiput not lobate.
6. Posterior and median limbs lobate 14. Genus HETEROCHÆTA, Westwood.
- 6.6. Posterior and median limbs not lobate. (Anterior coxae not expanded before the apex.) 15. Genus PSEUDOCHEETA, Kirby.
- 5.5. Occiput lobate.
6. Posterior and median limbs not lobate or spinuloso-carinate. 17. Genus HETEROCHÆTULA, Wood-Mason.
- 6.6. Posterior and median limbs lobate or spinuloso-carinate.
7. External margin of anterior femora with five spines. (Head slightly broader than the pronotum at the supracoxal dilation; ocellar eminence subquadrate; apex of cerci shallowly bifid; posterior and median limbs very short, genicular spines absent.) 18. Genus PARADANURIA, Wood-Mason.
- 7.7. External margin of anterior femora with six spines.
8. Posterior limbs long and slender, with curved aciculate genicular spines. First to seventh ventral abdominal segments produced posteriorly into delicate filamentous median processes. Organs of flight extending nearly to the apex of the abdomen. Apex of cerci shallowly bifid 19. Genus EUTHYPHELES, Wood-Mason.

- 8.8. *Posterior limbs short, with short submucronate genicular lobes. Second to sixth ventral abdominal segments carinate. Organs of flight hardly extending beyond the fifth abdominal segment. Apex of cerci rotundate* . . . 20. GENUS *ÆTHALOCHROA*, Wood-Mason.
- †.4. *Cerci terete-moniliform or fusiform.*
5. *Occiput more or less distinctly bi- or quadri-lobate.*
6. *Anterior coxae with lamellate dilation at distal extremity of anterior margin.*
7. *Body very elongate, smooth or granulose. Lateral pair of occipital tubercles distinctly surpassing the others (when these are present) in size. Limbs elongate, very slender. Posterior limbs not lobed.*
8. *Form extremely elongate. Supra-ocular auriculiform lobes very low. Median tibiae lobate. (Cerci fusiform.)* . . . 22. GENUS *MACRODANURIA*, Sjöstedt.
- 8.8. *Form not extremely elongate. Supra-ocular auriculiform lobes high, acute. Median tibiae not lobate.*
9. *Median femora not lobate, rarely with several apical spines on the ventral surface. Anterior coxae with distal lamellate portion longer, less elevated. Secondary tubercles on vertex weaker.* . . . 23. GENUS *DANURIA*, Stål.
- 9.9. *Median femora lobate. Anterior coxae with distal lamellate portion shorter, more elevated. Secondary tubercles on vertex more pronounced.* . . . 24. GENUS *DANURIODES*, Giglio-Tos.
- 7.7. *Body moderately long, rugose. Head with occipital tubercles subequal in size. Limbs moderately robust. Posterior limbs (of female) lobed. Dorsum of the anterior femora bearing before the apex an acute lobe* 25. GENUS *POPA*, Stål.
- 6.6. *Anterior coxae without distal lamellate dilation. (Body little elongate, rugose. Anterior femora with their superior border terminating in a tooth. Median and posterior limbs lobate. Supra-anal plate short.)* . . . 26. GENUS *DANURIELLA*, Westwood.
- 5.5. *Occiput not lobate. (Median and posterior femora with a preapical lobe.)* 27. GENUS *PHITRUS*, Karsch.
- 2.2. *Pronotum very short, ovate, little longer than broad. (Limbs carinate, pilose, not lobate; occiput with juxta-ocular processes.)* 28. GENUS *JALLA*, Giglio-Tos.

I. GENUS CARDIOPTERA, BURMEISTER

Cardioptera. Burmeister, Handb. Ent. Bd. 2, Abth. 2, Pt. 1, p. 540 (1838).

Characters. — Form with long almost entirely hyaline tegmina and wings in the male, female with short chiefly opaque tegmina and wings. Vertex hardly arcuate and not distinctly elevated above the eyes; ocelli of the male large, placed close together in a triangle, of the female less conspicuous; facial shield strongly transverse, obtuse-angulate dorsally; eyes moderately prominent; antennæ of the male serrate, of the female simple. Pronotum of the male with the shaft slender in the middle, widening anteriorly and posteriorly, collar rather heavy, the supracoxal dilation but little wider than the collar, margins of the collar with obsolete dentiform tubercles, no median carina present; of the female short with the posterior portion narrowed, the collar and supracoxal dilation broad, lateral margins with rather strong teeth. Tegmina of the male elongate, reaching beyond the apex of the abdomen, subequal, apex rather narrowly rounded, hyaline except for an infusate area along the principal veins; of the female short, ovate, no longer than the abdomen, opaque, principal veins placed nearly in the middle of the tegmen. Wings of the male ample, hyaline except for a narrow costal section; of the female slightly shorter than the tegmina, with the transverse nervures banded with color. Abdomen slender, subfusiform in the male, obese, broad and ovate in the female; subgenital plate of the male trigonal. Anterior limbs moderately robust, the coxæ with the margins furnished with curved claw-like spines, the internal faces provided with numerous low callosities; femora with three discoidal spines, the lateral face with six spines, internal face with fifteen spines; tibiæ (without apical claw) about half the femoral length. Median and posterior limbs slender and simple aside from a small triangular lobe placed immediately before the apex of the posterior femora on the interno-ventral margin; tibiæ of the male terete, the median and posterior limbs of the same sex strongly pilose.

Geographical distribution of species. — A single species is known from the Neotropical region.

1. *C. brachyptera*, Burmeister, Handb. Ent. Bd. 2, Abth. 2, Pt. 1, p. 541 — Brazil, Guiana. (1838) (*Mantis*). — **Plate, Fig. 1.**

Mantis sublobata, Serville, Hist. Nat. Ins. Orth. p. 180 (1839); Charpentier, Orth. Descr. et Depicta, t. 37 (1845).

Mantis pilipes, Serville, Hist. Nat. Ins. Orth. p. 192 (1839). (Based on c .

2. GENUS OXYOPSIS, CAUDELL

Oxyops. Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, pp. 56, 66 (1869) (not of Schönherr, 1826).

Oxyopsis. Caudell, Journ. New York Ent. Soc. Vol. 12, p. 184 (1904).

Characters. — Form with elongate almost entirely hyaline tegmina and wings in the male; females with moderately short tegmina, wings hyaline irregularly barred with color. Head trigonal, the eyes angulate or produced laterally; vertex hardly elevated above the eyes and usually straight; ocelli of the male large and placed in a subequal triangle, of the female small and placed in a depressed triangle; facial shield strongly transverse, the dorsal margin with a median truncate section; antennæ of the male subserrate, of the female simple. Pronotum with the shaft elongate, supracoxal dilation moderately prominent, collar moderately tapering; anterior margin rounded, lateral margins serrate or

unarmed in the male, spined in the female, median carina present more or less distinctly. Tegmina of the male elongate, hyaline except for the costal field which is opaque, the apex acute or rounded, stigma not indicated; of the female hardly exceeding the abdomen, broad, opaque except for the presence of small hyaline areolæ between the veins of the anal and a variable portion of the discoidal fields, costal field nearly a half the width of the tegmen, apex acute or obtusely rounded, stigma present, longitudinal. Wings of the male hyaline, extending some distance beyond the tegmina, opaque on or near the margins at the apex; wings of the female projecting beyond the tegmina, the exposed area being either rounded, obtuse-angulate and broader than long or acute angulate and longer than broad, the exposed apex opaque, the remainder hyaline fasciculate with color. Abdomen of the male elongate, of the female broad, depressed. Limbs of both sexes slender; anterior coxæ armed on the ventral margin with low spines of two sizes in the female, of one size in the male; anterior femora armed with four discoidal spines, the lateral face with four spines, the internal face with fourteen to sixteen spines of two sizes; anterior tibiæ (without apical claw) slightly less than half the femoral length. Median and posterior limbs slender and simple; tibiæ multicarinate.

Type of the genus : *O. rubicunda* (Stoll).

Geographical distribution of species.—Eight species are known from the Neotropical region.

1. *O. rubicunda* (Stoll), Natuur. Afbeeld. Beschr. Spookten en Wandel. Blad. British Guiana, Surinam, Cayenne, Brazil, Ecuador, northern Argentina.
pp. 73, 79, pl. 25, f. 96 (1813) (*Mantis*).
rubicunda, Saussure, Mém. Hist. Nat. Mex. Mant. Amer. p. 87, pl. 1, f. 6 (1871) (*Stagmatoptera diluta* ♂ not ♀); Westwood, Revis. Ins. Fam. Mant. p. 15, pl. 6, f. 3 (♂) (1889).
2. *O. dubiosa* (Giglio-Tos), Boll. Mus. Zool. Anat. Comp. Torino, Vol. 13, no. 311, p. 18 (1898). Valley of Santiago, Ecuador.
3. *O. acutipennis* (Stål), Bihang Svenska Vet.-Akad. Handl. Vol. 4, no. 10, p. 71 (1877). Peru.
4. *O. media* (Stål), ibidem, p. 71 (1877). São Paulo, Brazil.
5. *O. obtusa* (Stål), ibidem, p. 72 (1877). Brazil.
6. *O. lobeter*, Rehn, Proc. Acad. Nat. Sc. Philad. 1907, p. 159, ff. 3, 4 (1907). Sapucay, Paraguay.
— Plate, Fig. 11.
7. *O. borellii* (Giglio-Tos), Boll. Mus. Zool. Anat. Comp. Torino, Vol. 12, no. 302, p. 15 (1897). Northern Argentina and southern Bolivia.
8. *O. paraguayensis* (Brancsik), Jahresh. Naturw. Ver. Trencsén, Vol. 19-20, p. 64, t. 1, f. 10 (1898). Asuncion, Paraguay.

3. GENUS PAROXYOPSIS, NOV. GEN.

Characters. — General form and structure much as in *Oxyopsis*. Eyes produced, but with the apices rounded. Tegmina with the costal field narrow, one-third to one-fourth the total width of the tegmen and densely reticulate with no oblique veins; stigma transverse. Posterior femora with a small lobe at the apex of the inferior carina.

Geographical distribution of species. — A single species is at present known to belong to this genus, occurring in the Neotropical region.

1. *P. icterica* (Saussure & Zehntner), Biol. Centr.-Amer. Orth. Vol. 1, p. 191 (1894). South America : Urucum, Matto Grosso, Brazil.
icterica, Giglio-Tos, Boll. Mus. Zool. Anat. Comp. Torino, Vol. 15, no. 377, p. 2 (1900).

4. GENUS PSEUDOXYOPS, SAUSSURE & ZEHNTNER

Pseudoxyops. Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, p. 185, pl. 11, f. 8 (1894).

Characters (1). — Eyes almost subacuminate; face flattened. Pronotum elongate, slender, little dilated above the coxæ, the margins hardly serrate. Tegmina oval, very obtuse, ampliate for two-thirds the distance from the base, opaque; costal field occupying half the whole width, costal veins very distinct and disposed more transverse than longitudinal, stigma linear. Wings pellucid, fasciculate with yellow; apex subangulate; ulnar vein undivided. Anterior femora with four external spines.

Geographical distribution of species. — A single species from Tropical America is known.

1. *P. perpulchra* (Westwood), Revis. Ins. Fam. Mant. p. 36, pl. 11, f. 8 Ega, Amazonas, Brazil. (1889) (*Stagmatoptera*).

perpulchra, Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, p. 185 (1894).

5. GENUS PARASTAGMATOPTERA, SAUSSURE

Parastagmatoptera. Saussure, Mém. Hist. Nat. Mexique, Mant. Amér. p. 83 (1871).

Characters. — Form with long tegmina, hyaline with the costal margin frequently opaque in the male, wings hyaline in the same sex; female with moderately long opaque tegmina frequently having scattered hyaline areas and with barred or tessellate wings. Antennæ, margins of tegmina and wings and feet occasionally pilulose (in male of *P. ciliata*). Vertex truncate, entirely or in the juxta-ocular portions more or less elevated above the eyes; ocelli of the male very large, approximate, placed in a triangle, of the female smaller, disposed in an arcuate line; facial shield transverse, obtuse-angulate dorsally with the angle truncate; eyes moderately prominent, convex; antennæ of male serrate more or less distinctly, subpectinate in *serricornis*, of female setaceous. Pronotum distinctly shorter than the tegmina in both sexes, in the male slender, subcarinate, the margins hardly (*vitrepennis*) or distinctly (*ciliata*) denticulate for the entire length, the supracoxal dilation slight; in the female more robust, not (*flavoguttata*) or but slightly (*serricornis*) carinate, the margins distinctly denticulate for their entire length, the supracoxal dilation distinct, but not strongly developed. Tegmina longer than the abdomen in both sexes, in the male elongate, vitreous, costal field coriaceous, dilated basally, the greatest width about a fourth the total width of the tegmen, the principal veins colored in contrast to the coriaceous costal field (*serricornis*), apex rounded subangulate; in the female broader than in the male and more ovate, coriaceous, frequently with a number of hyaline areas in the discoidal and sutural sections, costal field about a third the total width of the tegmen, narrowing in the apical half, the apex bluntly angulate; stigma present, but variable in shape. Wings barred or tessellate in the female, hyaline in the male, the costal margin frequently opaque in the female; discoidal vein ramose in the two sexes. Limbs slender. Anterior coxæ rather sparsely denticulate or spinoso-granulate on the superior margin (these piligerous in *ciliata*), blackish area of internal face variable in position and size; anterior femora with four discoidal spines, the external margin with four spines, internal margin with alternating large and small spines, internal face with various types of coloration. Median and posterior limbs simple, without lobes. First

(1) The female sex alone is known

joint of the tarsi quite long. Abdomen subequal, attenuate in the male, fusiform, depressed in the female; cerci of male distinctly articulate, composed of numerous segments; supra-anal plate of both sexes transverse.

Type of the genus : *P. flavoguttata*, Saussure (not of Serville) = *serricornis*, Kirby.

Geographical distribution of species. — Six species from the Neotropical region are known to belong to this genus.

1. *P. flavoguttata* (Serville), Hist. Nat. Ins. Orth. p. 183 (1839) (*Mantis*). Cayenne.
2. *P. serricornis*, Kirby, Syn. Cat. Orth. Vol. 1, p. 298 (1904). — **Plate**, Brazil, Santarem.

Fig. 2.

Stagmatoptera flavoguttata, Saussure, Mém. Hist. Nat. Mex. Mant. Amer. p. 84, pl. 1, f. 5 (1871) (not of Serville).

P. flavoguttata, Westwood, Revis. Ins. Fam. Mant. p. 16, pl. 6, f. 1 (1889) (not of Serville).

3. *P. unipunctata* (Burmeister), Handb. Ent. Bd. 2, Abth. 2, Pt. 1, p. 540 (1838) (*Mantis*); Berl. Ent. Zeitschr. Vol. 8, p. 238 (1864) (*Mantis*). Brazil, Buenos Ayres.
4. *P. tessellata*, Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, p. 188 (1894). Cayenne, British Guiana.
5. *P. ciliata* (Stål), K. Svenska Freg. Eugen. Resa. Ins. p. 313 (1860) (*Mantis*). Rio Janeiro.
6. *P. vitrepennis*, Bruner, Journ. New York Ent. Soc. Vol. 14, p. 144 (1906). Trinidad.
7. *P. (?) simulacrum* (Fabricius), Ent. Syst. Vol. 2, p. 21 (1793) (*Mantis*). America.
8. *P. (?) diluta* (Stoll), Natuur. Afbeeld. Beschr. Spookten en Wandel. Blad. p. 66, pl. 22, f. 83 (1813) (*Mantis*). Surinam.

6. GENUS LOBOCNEME⁽¹⁾, NOV. GEN.

Parastagmatoptera. Redtenbacher, Proc. Zool. Soc. Lond. p. 206 (1892).

Characters. — Form of female moderately robust. Vertex truncate, slightly elevated above the eyes; fascial shield transverse, the dorsal margin arcuate; ocelli of moderate size, placed in an arcuate line (♀); eyes mammiform-rotundate (♀), moderately prominent; antennæ serrate (♂) or setaceous (♀). Pronotum moderately slender, the supracoxal dilation quite marked (♀), disk subtuberculate, hardly carinate, lateral margins distinctly denticulate, the shaft as a whole distinctly narrower than the collar. Tegmina of male elongate hyaline, with costal field dilated basally, opaque coriaceous; of female broad, ovate, opaque coriaceous, the marginal field very broad, in the middle two-fifths of the entire width of the tegmen, narrowed in the apical third by the moderately oblique and rounded excision of this area; stigma longitudinal, whitish, sometimes with a contiguous small fuscous spot. Wings vitreous (♂) or flavo-tessellate (♀); discoidal vein with two distal rami (♀). Anterior limbs robust; anterior coxæ considerably dilated at the apical extremity of the internal face, margin denticulate, the apical extremity with a large blackish spot; anterior femora quite broad, with four discoidal spines, external margin with four spines, internal margin with alternating large and small spines. Median and posterior femora of both sexes with a decided rounded lobe on the apical portion of the posterior ventral carinæ, the lobes and the genicular portions of the femora and tibiæ infusate.

Geographical distributon of species. — A single species from the West Indian subregion is known.

¹⁾ Derived from *λoβoς* lobe and *κνeme* leg.

1. *L. lobipes* (Redtenbacher), Proc. Zool. Soc. Lond. p. 206, pl. 15, f. 8a-b (St. Vincent, Grenada, 1892) (*Parastigmatoptera*).
lobipes, Brunner von Wattenwyl, ibidem, p. 605, pl. 52, f. 4 (1893) (*Parastigmatoptera*).

7. GENUS LEPTOCOCE⁽¹⁾, NOV. GEN.

Characters. — Female sex alone known. Form rather slender. Head broader than deep; ocelli small, placed in a strongly arcuate line; facial shield strongly transverse; eyes prominent; face subconcave; antennæ setaceous. Pronotum elongate, nearly twice as long as the anterior coxæ and subequal to the tegmina in length, shaft subequal in width, ampliation hardly marked, collar slight broader than the shaft, margins of the cephalic half denticulate, the denticulations becoming obsolete posteriorly, median carina distinct. Tegmina moderately coriaceous opaque, subrectangulate-elliptical, apex broadly rounded, margins subparallel, costal field narrow, its greatest width not more than a fourth the entire tegminal width, very slightly wider proximally than toward the apex; stigma distinct, rotundate. Wings nearly as broad as long, the humeral field hardly projecting beyond the axillary one, apex rounded rectangulate, the humeral field and basal portion of the axillary field opaque yellow, the remainder of the axillary field flavo-tessellate; discoidal vein uniramose. Anterior limbs rather robust; coxæ armed on the anterior margin with a series of alternating large and small teeth, the larger of which are subfalcate, posterior surface with numerous adpressed spiniform asperities; femora with four discoidal spines and armed on the external margin with four spines, the internal margin with alternating large and small spines; metatarsi of cephalic limbs elongate. Median limbs much shorter than the posterior pair.

Geographical distribution of species. — A single species is known from the Neotropical region.

1. *L. thoracica*, nov. sp. (2).

Venezuela.

8. GENUS STAGMATOPTERA, BURMEISTER

Stigmatoptera. Burmeister, Handb. Ent. Bd. 2, Abth. 2, Pt. 1, p. 537 (1838).

Characters. — Head trigonal, as broad as high or somewhat broader than high; vertex truncato-transverse, subcompressed; eyes prominent, rounded or rotundato-angulate; facial shield broader than high, dorsal margin obtuse-angulate with the immediate angle rounded; antennæ setaceous in both sexes. Pronotum moderately or considerably elongate; dilation distinctly present but of variable prominence and well rounded or subobtuse-angulate; collar with ampliation ovoid; shaft trigonal in section, margins regularly constricted in the median portion or subequal; median carina distinct or hardly present; lateral margins finely or strongly and coarsely spined in the female, unarmed or with fine teeth in the male. Tegmina of male narrow, elongate, longer than the abdomen, ovular or with

(1) Derived from λεπτός *narrow* and αὐτὸς *edge*.

(2) *Leptococe thoracica*, nov. gen. and sp.

Type: ♀; Culata, Venezuela, 2000 meters elevation. (*Acad. Nat. Sc. Philad.*)

Head with greatest width nearly twice that of pronotum; eyes slightly directed anteriorly; vertex distinctly concave. Median and posterior femora much stronger carinate than the tibiae. General color of head, pronotum, abdomen and limbs dull buff, washed with sulphur yellow around the mouth and very slightly so on the anterior limbs; eyes mars brown; median and posterior limbs clouded with russet. Tegmina very pale apple green, stigma seal brown surrounded by a narrow isabelline annulus. Wings canary yellow, toward the periphery of the posterior field broken into tessellations with hyaline interstices. Spines of the anterior femora and tibiae tipped with black. Length of pronotum 10.5 mm.; greatest width of pronotum 4; length of tegmen 20.5; greatest width of tegmen 7; length of anterior femur 13.

The type is the only specimen seen.

subparallel margins, apex rotundate; costal field and region of principal veins opaque, coriaceous, posteriorly hyaline; stigma present or rarely (in *hyaloptera*) absent; ocellar spot obliterate or indicated by several disconnected maculations; tegmina of female elongate-ovate or ovate; anterior margin gently arcuate, with the distal third strongly arcuate or obliquely subtruncate; apex broadly rounded, acute, attenuate or very blunt; costal field coriaceous, broad, from a third to two-fifths the total width of the tegmen and densely areolate, discoidal field semi-membraneous or coriaceous with membraneous points; stigma usually present, white or concolorous, linear or pyriform, obliquely transverse or longitudinal, in close proximity to the principal veins or placed a distance posterior to the same; ocellar spot present or absent, where present marked and usually of considerable size, the stigma forming a portion of the periphery; discoidal sectors from six to eight in number; marginal field with the veins moderately distinct and regularly oblique or rarely almost lost in the reticulations (*insatiabilis*); anal area hyaline, usually ornamented with opaque nervure bands or punctate with opaque color. Wings of male hyaline with anterior border and apex slightly opaque; discoidal vein with two or three rami; axillary and humeral fields frequently with more or less distinct rudimentary transverse opaque bars on the cross veins; wings of female large and broad, hyaline with the costal margin and extremity opaque, the remainder with a conspicuous pattern of opaque yellowish bars on the cross veins; humeral field very broad; discoidal vein with two rami; apex rounded or subacuminate (*grandidieri*). Anterior limbs of male moderately robust; coxæ unarmed or denticulate on the margins; femora with the internal face plain or with median spot: anterior limbs of female quite robust; coxæ with both margins equally denticulate or with the posterior very finely spinulose when compared with the anterior; femora with four discoidal spines and strong marginal spines, internal face unmarked or ornamented with a single large spot or a series of varicolored maculations and striæ; tibiæ with ten to thirteen spines on the external margin and twelve to sixteen on the internal. Abdomen of male slender, of female broad and depressed; supra-anal plate of male trigonal, subgenital plate ample, produced; supra-anal plate of female transverse, trigonal, broadly rounded or very slightly and shallowly emarginate (*femoralis*).

Type of the genus (1) : *S. predicatoria*, Saussure.

Geographical distribution of species. — Twenty-one species of the genus are known; one West African, three from Madagascar and the remainder from the Neotropical region, ranging from Nicaragua to Argentina.

1. *S. biocellata*, Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, p. 67 (1869). Brazil.
2. *S. supplicaria*, Burmeister, Handb. Ent. Bd. 2, Abth. 2, Pt. 1, p. 542 Guiana, Surinam, Brazil.
(1838) (*Mantis*). — **Plate, Fig. 5.**
supplicaria, Saussure, Mém. Hist. Nat. Mex. Mant. Amér. p. 94, pl. 1, f. 11 (1871).
precaria, Lichtenstein, Trans. Linn. Soc. Lond. Vol. 6, p. 26 (1802) (*Mantis*) (not of Linnæus, 1758); Stoll, Natuur. Afbeeld. Beschr. Spoken en Wandel. Blad. pp. 51, 78, pl. 17, f. 62 (1813) (*Mantis*) (not of Linnæus, 1758).
flavipennis, Serville, Hist. Nat. Ins. Orth. p. 182 (1839) (*Mantis*).
3. *S. hyaloptera* (Perty), Delect. Anim. Artic. p. 117, pl. 23, f. 6 (1830-1834) (*Mantis*). Guiana, Cayenne, Amazon River.
hyaloptera, Saussure, Mém. Hist. Nat. Mex. Mant. Amér. p. 95, pl. 1, f. 12 (1871).
4. *S. luna* (Serville), Hist. Nat. Ins. Orth. p. 183 (1839) (*Mantis*). Cordoba, Argentina.
5. *S. predicatoria*, Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, p. 232 Brazil, eastern Peru.
(1870); Mém. Hist. Nat. Mex. Mant. Amér. p. 92, pl. 1, f. 10 (1871).
6. *S. binotata*, Scudder, Proc. Bost. Soc. Nat. Hist. Vol. 12, p. 341 (1869). Eastern Peru.

7. *S. septentrionalis*, Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, p. 186, pl. 8, f. 2 (1894). Panama.
8. *S. minor*, Saussure & Zehntner, ibidem, p. 187 (1894). Colombia, Venezuela.
9. *S. pia*, Saussure & Zehntner, ibidem, p. 187 (1894). Brazil.
10. *S. precaria* (Linnæus), Syst. Nat. (ed. 10), Vol. 1, p. 426 (1758) (*Gryllus* [Mantis]). Colombia, Guiana, Brazil, Argentina.
precaria, Palisot de Beauvois, Ins. Rec. Afriq. et Amér. p. 61, Orth. pl. 12, f. 1 (1805) (Mantis); Brunner von Wattenwyl, Observ. Color. Ins. p. 3, pl. 2, ff. 22a, b (1897).
octosetosa, Goeze, Ent. Beytr. Vol. 2, p. 35 (1778) (Mantis).
cubitata, Goeze, ibidem, p. 34 (1778) (Mantis).
obscuraria, Lichtenstein, Trans. Linn. Soc. Lond. Vol. 6, p. 28 (1802) (Mantis).
ocellata, Olivier, Encycl. Méth. Ins. Vol. 7, p. 639 (1792) (Mantis).
annulata, Stoll, Natuur. Afbeeld. Beschr. Spook en Wandel. Blad. pp. 55, 78, pl. 18, f. 66 (1813) (Mantis); Saussure, Mém. Hist. Nat. Mex. Mant. Amér. p. 91, pl. 1, f. 9 (1871).
rogatoria, Stoll, Natuur. Afbeeld. Beschr. Spook en Wandel. Blad. pp. 73, 79, pl. 25, f. 95 (1813) (Mantis).
11. *S. femoralis*, Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, p. 187 (1894). Surinam, Cayenne, British Guiana.
12. *S. indicator* (Olivier), Encycl. Méth. Ins. Vol. 7, p. 641 (1792) (Mantis). Surinam.
bodegetica, Lichtenstein, Trans. Linn. Soc. Lond. Vol. 6, p. 26 (1802) (Mantis).
sancta, Stoll, Natuur. Afbeeld. Beschr. Spook en Wandel. Blad. pp. 52, 78, pl. 17, f. 63 (1813) (Mantis) (not of Fabricius, 1787).
13. *S. pagana*, Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, p. 232 (1870). Bogota, Colombia.
14. *S. costalis*, Burmeister, Handb. Ent. Bd. 2, Abth. 2, Pt. 1, p. 532 (1838) (Mantis). Brazil.
15. *S. insatiabilis*, Rehn, Proc. U. S. Nat. Mus. Vol. 27, p. 572 (1904). Costa Rica.
16. *S. typhon*, Rehn, The Canad. Entom. Vol. 36, p. 107 (1904). Nicaragua.
17. *S. abdominalis* (Olivier), Encycl. Méth. Ins. Vol. 7, p. 640 (1792) (Mantis). Surinam.
birivia, Stoll, Natuur. Afbeeld. Beschr. Spook en Wandel. Blad. pp. 28, 77, pl. 9, f. 31 (1813) (Mantis).
urbana, Lichtenstein, Trans. Linn. Soc. Lond. Vol. 6, p. 27 (1802) (Mantis).
18. *S. vitripennis*, Bolivar, Mem. Soc. Esp. Hist. Nat. Vol. 1, p. 471 (1908). Cameroon, West Africa.
19. *S. freyi* (Brancsik), Jahresh. Ver. Trencsin Com. Vol. 15-16, p. 177, pl. 9, ff. 1-1a (1893) (*Hierodula* [*Sphodromantis*]). Nossi Be Island, Madagascar.
freyi, Saussure & Zehntner, in Grandidier, Hist. Phys. Nat. et Pol. Madagascar, Orth. Vol. 1, p. 224, pl. 6, ff. 1, 2 (1895).
20. *S. acutipennis* (Westwood), Revis. Ins. Fam. Mant. p. 34, pl. 1, f. 8 (1889) (*Hierodula*). Madagascar.
acutipennis, Saussure & Zehntner, in Grandidier, Hist. Phys. Nat. et Pol. Madagascar, Orth. Vol. 1, p. 228, pl. 7, f. 5 (1895).
21. *S. grandidieri*, Saussure & Zehntner, ibidem, p. 226, pl. 7, ff. 3, 4 (1895). Madagascar.

9. GENUS HETEROVATES, SAUSSURE

Heterovates. Saussure, Mélang. Orth. Pt. 4, pp. 84, 85, pl. 9, f. 32 (1872).

Characters (1). — Head small, not broad; facial scutellum transverse, front smooth, concave, sulcate, vertex compressed; eyes inflated anteriorly; ocelli very large; antennæ short, filiform. Prono-

(1) The male sex is unknown.

tum elongate, slightly carinate, the supracoxal dilation short, the collar subequal and rounded anteriorly, margins coarsely dentate; region of the dilation with two large tubercles, the base of the collar also with two smaller ones. Tegmina ovate-lanceolate, reaching or surpassing the apex of the abdomen, semi-opaque, the costal margin considerably arcuate, costal field opaque. Wings hyaline, fasciate with yellow, anterior border straight; discoidal vein simple or furcate. Anterior limbs very long and slender, femora slightly arcuate. Median and posterior limbs short, not compressed; femora bearing a small foliaceous lobe at the extremity; tibiae multicarinate, the carinae ornamented with fine depressed hairs. Abdomen fusiform, the supra-anal plate short, cerci cylindrical.

Geographical distribution of species. — A single species is known from the Brazilian subregion.

1. *H. pardalina*, Saussure, Mélang. Orth. Pt. 4, p. 85, pl. 9, f. 32 (1872). Brazil.

10. GENUS ZOOLEA, SERVILE

Zoolea, Serville, Hist. Nat. Ins. Orth. p. 154 (1839).

Characters. — Form elongate, slender (much resembling members of the subfamily *Empusinae*). Head with the vertex subtruncate, distinctly elevated above the eyes, juxta-ocular sulci very deep and sharply delimiting the eyes from the frontal processes; facial shield as high as broad, the dorsal margin subrectangulate; frontal processes elongate, lanceolate, longer than the head is broad, contiguous, the apices acute, the margins undulate; antennae elongate, slender, of male serrulate on the internal side, of female setaceous; eyes rounded, directed anteriorly. Pronotum elongate, the shaft slender, subequal and over two-thirds the entire pronotal length, trigonal in section; ampliation short and decided with the outline rounded, the anterior extremity being trilobate in consequence; margins uniformly serrulate. Tegmina subacuminate, moderately opaque, subcoriaceous, costal field of the female narrow, the greatest width not more than a fourth the total tegminal width, gradually narrowing to the apex, not distinctly excised. Wings of female hyaline except at the apex, which is partially coriaceous-opaque; the humeral field considerably surpassing the axillary field; discoidal vein ramose. Abdomen bearing median foliaceous lobes on the venter of the distal segments and supplied (in *lobipes*) at the angles of the same segments with smaller but similar appendages. Limbs strongly lobate; anterior femora with a distinct acute preapical lobe on the dorsal margin, discoidal spines four in number, external margin of femora armed with four spines; the median and posterior limbs with strongly developed lobes, the femora with the margins with from one to three marked lobes, the tibiae with a pair of premedian more or less angulate lobes. Tarsi elongate, the first joint longer than the others together.

Type of the genus : *Z. lobipes* (Olivier).

Geographical distribution of species. — Two species are known from the Neotropical region.

1. *Z. lobipes* (Olivier), Encycl. Méth. Ins. Vol. 7, p. 637 (1792) (*Mantis*). — Brazil, Guiana, Peru.

Plate, Fig. 4.

lobipes, Guérin, Icon. Règne Anim. Vol. 3, p. 327, pl. 52, f. 5 (1829-44) (*Empusa*).

macroptera, Stoll, Natur. Afbeeld. Beschr. Spookten en Wandel. Blad. p. 26, pl. 8, f. 30 (1813) (*Mantis*); Charpentier, Orth. Descr. Depicta, pls. 25, 26 (1841-45) (*Vates*).

orbis, Burmeister, Handb. Ent. Bd. 2, Abth. 2, Pt. 1, p. 544 (1838) (*Vates*).

2. *Z. multilobata*, Chopard, Bull. Soc. Ent. Fr., 1910, p. 182.

French Guiana.

II. GENUS PHYLLOVATES, KIRBY

Theoclytes. Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, pp. 53, 60 (1869) (not of Serville, 1839).

Phyllovates. Kirby, Syn. Cat. Orth. Vol. 1, p. 302 (1904).

Characters. — Form of male elongate, slender, of female elongate but with the posterior part of the body robust. Head trigonal; occiput subtruncate, slightly elevated above the eyes; juxta-ocular sulci distinct, front bicornate or bituberculate; ocelli placed in a triangle; facial shield transverse, dorsal margin more or less obtuse-angulate, the apex slightly produced; eyes large, rounded; antennae of male serrate or subpectinate on the internal margin, of female simple. Pronotum elongate, slender, straight, the anterior fourth but little dilated, the shaft subequal in width; supracoxal dilation gradual, regularly convergent anteriorly and posteriorly, the anterior margin of the pronotum broadly rounded; median carina strongly marked on the shaft, represented by a sulcus on the collar; margins dentate or denticulate, occasionally strongly dentate (*spinicollis*) and often with intercalated denticulations, the points most numerous on or anterior to the ampliation. Tegmina of male elongate, membranaceous, vitreous, greatly exceeding the apex of the abdomen, more or less fusco-maculate with the costal field opaque green, the latter moderately wide proximally, greatly but gradually narrowing distally; tegmina of female opaque, broad, but little exceeding the apex of the abdomen, costal field distinctly excised at the apex or obliquely attenuate, discoidal field with at least two oblique fuscous maculations of variable size, anal field membranaceous, blackish. Wings of male vitreous, anterior margin greenish, apex fusco-punctate; wings of female membranaceous, blackish-brown, anterior margin yellowish, apical margin paler than disk, apex infusate, the greater number of the cross veins outlined in hyaline, apex acuminate. Limbs not lobate, the median and posterior pair multicarinate, the femora and tibiae of these limbs a little arcuate; anterior coxæ remotely spinose on the anterior margin, often with one or more intercalated spinulations, spinuloso-granulate or sparsely granulate on the posterior margin; anterior femora with four discoidal spines, external margin with four spines; tarsi of the median and posterior limbs rather short. Abdomen without foliaceous lobes.

Type of the genus : *P. chlorophaea* (Blanchard).

Geographical distribution of species. — Ten forms of the genus are known from Tropical and Subtropical America, ranging from the southern United States to southern Brazil.

1. *P. chlorophaea* (Blanchard), Mag. Zool. 1836, Ins. pl. 135 (1836) (*Mantis*). Gulf States to Costa Rica.

chlorophaea, Saussure, Miss. Scientif. Mexiq. Orth. p. 292, pl. 5, ff. 4,

4a (1872) (*Theoclytes*).

mexicana, Saussure, Rev. Mag. Zool. (2), Vol. 13, p. 127 (1861) (*Mantis*).

azteca, Saussure, ibidem (2), Vol. 11, p. 61 (1859) (*Theoclytes*).

2. *P. cornuta* (Saussure & Zehntner), Biol. Centr.-Amer. Orth. Vol. 1, Guatemala.

p. 191 (1894) (*Theoclytes chlorophaea*, var.)

3. *P. maya* (Saussure & Zehntner), ibidem, p. 192, pl. 10, f. 33 (1894) Mexico, Yucatan.

(*Theoclytes*).

4. *P. brevicornis* (Stål), Bihang Svenska Vet.-Akad. Handl. Vol. 4 (10), Colombia, Brazil.

p. 74 (1877) (*Pseudovates*).

5. *P. stollii* (Saussure & Zehntner), Biol. Centr.-Amer. Orth. Vol. 1, p. 192 Guiana, Brazil.

(1894) (*Theoclytes*). — (**Plate, Fig. 7**).

cingulata, Stoll, Natur. Afbeeld. Beschr. Spoken en Wandel. Blad.

pp. 29, 77, pl. 9, f. 32 (1813) (not of Drury, 1773).

6. *P. parallela* (Haan), in Temminck, Natuurl. Geschied. Nederl. Overz. Guiana, Surinam.

Bezitt. Zool. Orth. p. 79 (1842) (*Mantis*).

parallela, Saussure, Mém. Hist. Mex. Mant. Amér. p. 176, pl. 2, f. 33

(1871) (*Theoclytes*).

surinamensis, Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, p. 60 (1869, *Theoclytes*); Mém. Hist. Nat. Mex. Mant. Amér. pl. 1, f. 19 (1871, *Theoclytes*).

7. *P. spinicollis* (Saussure & Zehntner), Biol. Centr.-Amer. Orth. Vol. 1, Brazil, p. 193, pl. 6, f. 2 (1894) (*Theoclytes*).
8. *P. iheringi* (Saussure & Zehntner), ibidem, p. 193 (1894) (*Theoclytes*). Rio Grande do Sul, Brazil.
9. *P. minor* (Saussure), Mélang. Orth. Pt. 4, p. 85, pl. 9, f. 33 (1872) Brazil. (*Theoclytes*).
10. *P. parvulus* (Westwood), Revis. Ins. Fam. Mant. p. 46 (1889) (*Theoclytes*). Brazil.

12. GENUS HAGIOTATA, SAUSSURE & ZEHNTNER

Hagiotata. Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, pp. 184, 197, pl. 8, f. 5 (1894).

Characters (1). — Front bituberculate; facial scutellum transverse, above obtuse-angulate; vertex very slightly higher than the eyes. Pronotum moderately short, strongly granulate, margins with isolated teeth of considerable size between which dentations of a smaller size are placed; median carina extending the total length of the pronotum; collar with two weak rows of teeth, near the base, however, with two strong tubercles. Tegmina narrowed toward the apex, which is rounded and not emarginate; costal field very narrow, slightly ampliate toward the base; sutural margin subhyaline. Wings with the anterior field narrow, apex arcuato-truncate. Limbs moderately short. Abdomen with the fourth segment lobate.

Geographical distribution of species. — A single species is known from Brazil.

1. *H. hofmanni*, Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, Brazil, p. 197, pl. 8, f. 5 (1894) (*Theoclytes hofmanni* on plate).

13. GENUS VATES, BURMEISTER

Vates. Burmeister, Handb. Ent. Bd. 2, Abth. 2, Pt. 1, p. 543 (1838).

Theoclytes. Serville, Hist. Nat. Ins. Orth., p. 150 (1839).

Pseudovates. Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, pp. 53, 60, 221 (1869-70) (2).

Characters. — Form rather elongate, the male slender, the female with the abdomen depressed-fusiform. Head transverse-trigonal; occiput subtruncate, elevated above the dorsal portion of the eyes, the frontal region decidedly oblique-declivent; juxta-ocular sulci distinct; frontal processes present as a pair of short, sharp, trigonal plates or as elongate, contiguous, parallel, narrow and apically acute lobes; ocelli placed in an arcuate line, large in the male, rather small in the female; frontal shield transverse, dorsal margin rectangulate or with the angle developed with a distinct projecting process; eyes prominent, rounded, directed somewhat anteriorly; antennæ of the female slightly serrulate, of the male more or less unipectinate on the internal margin, the apical portion in some species simply serrulate. Pronotum more or less elongate, the dilation short, broad and rather sharply contrasted with the subequal shaft, the outline of the ampliation and of the anterior portion of the collar rounded, the lateral margins of the collar subparallel, the anterior portion of the pronotum being of a trilobate form; median carina distinct, represented on the collar by a sulcus; margins almost entirely more or less spinu-

1) Known from the female alone.

(2) This division, which has been given generic rank by some authors, does not appear to us to be of generic value, the characters usually assigned as diagnostic, i. e. excised apical section of the marginal field of the female tegmina and the infusate wings of the same sex, shading off into true *Vates*. It would probably be more logical from the evidence of material in hand to divide the genus on the character of the frontal processes, but without more material this does not seem desirable.

lose. Tegmina of male elongate, subequal, costal field rather narrow, attenuate, virido-coriaceous, remainder almost entirely hyaline (*cingulata*) or greenish semi-hyaline, more decidedly hyaline toward the sutural margin, several oblique fuscous maculations usually present, apex rotundato-angulate; of female shorter, virido-coriaceous, the costal field sharply excised about a fourth the distance from the apex or slightly or hardly excised at the same point, fuscous maculations usual present as in male, apex acute or rotundato-angulate. Wings of male hyaline, more or less infusate or virido-coriaceous apically; of female strongly infusate with a preapical section as well as portion of the margin paler and transverse veins of the disk subhyaline, or hyaline with the costal margin and apex subcoriaceous. Abdomen with the lateral margins lobed or entire in the female, male without abdominal lobes. Anterior coxæ more or less distinctly spinulose on the anterior margin, usually with intercalated smaller spinulations; anterior femora with four discoidal spines, external margin with four spines. Median and posterior limbs more or less distinctly lobate and with strongly indicated carinæ; genicular lobes of median and posterior limbs produced subangulate.

Type of the genus : *V. lobata* (Fabricius).

Geographical distribution of species. — Sixteen species are known from the Neotropical region, ranging from the southern United States (Arizona) to Brazil and Peru, with one species found in the Greater Antilles.

1. *V. pectinata*, Saussure, Mém. Hist. Nat. Mex. Mant. Amér. p. 163, Vera Cruz and Tabasco, Mexico.
pl. 2, f. 34 (1871).
pectinata, Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, p. 196,
pl. 6, ff. 4, 5, pl. 10, ff. 30-32 (1894).
2. *V. foliata* (Lichtenstein), Trans. Linn. Soc. Lond. Vol. 6, p. 24 (1802) « Bengal », Guiana.
(*Mantis*).
subfoliata, Stoll, Natuur. Afbeeld. Besch. Spoken en Wandel. Blad.
pp. 55, 78, pl. 18, f. 67 (1813) (*Mantis*).
3. *V. sphingicornis* (Stoll), ibidem, pp. 59, 78, pl. 20, f. 74 (1813) (*Mantis*). « Amboina ».
4. *V. lobata* (Fabricius), Ent. Syst. Suppl. p. 190 (1798) (*Mantis*). Cayenne, Brazil.
hyalina, Charpentier, Silbermann Rev. Ent. Vol. 3, p. 316 (1835) (*Empusa*);
Orth. Descr. Depicta, pl. 2 (1841) (*Empusa*).
cuemidotus, Burmeister, Handb. Ent. Bd. 2, Abth. 2, pt. 1, p. 543 (1838).
5. *V. denticulata*, Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, p. 222 (1870). Surinam.
6. *V. amazonica* (Westwood), Revis. Ins. Fam. Mant. p. 46 (1889) Amazonia.
(*Theoclytes*).
7. *V. peruviana*, nov. sp. (1). Peru.
8. *V. pectinicornis* (Stål), Bihang Svenska Vet.-Akad. Handl. Vol. 4 (10). Chiriqui.
p. 73 (1877) (*Theoclytes*).

(1) *Vates peruviana*, nov. sp.— Type : ♂; Despoblado, N. Peru (*Acad. Nat. Sc. Philad.*).

Allied to *V. pectinicornis* Stål and *amazonica* Westwood, but differing from the former in the further suppression of the median and posterior femoral lobes and in the less elongate pectinations of the antennæ, and from the latter in the larger size, the suppression of the femoral lobes and in the antennæ being longer than the pronotum.

Size medium, form elongate. Head half again as broad as the greatest width of the pronotum, much broader than deep, occipital margin truncato-sinuate; vertex with processes rather short, slightly divergent, conic; eyes diverted slightly anteriorly; antennæ when extended posteriorly reaching slightly beyond posterior margin of pronotum, subpectinate. Pronotum slender, the greatest width contained about four and one-half times in length, shaft subequal, dilation considerable, rounded, collar slightly broader than the shaft, subequal, cephalic margin arcuate; lateral margins irregularly granuloso-dentate, these more numerous anteriorly than posteriorly, median carina distinct. Tegmina nearly twice as long as the pronotum, elongate, subequal; costal field narrow, slightly ampliate near base, narrowing regularly toward the apex, coriaceous, opaque, remainder of the tegmina subhyaline, apex rounded. Anterior coxæ very slightly more than half the length of the pronotum, on the anterior margin supplied with spaced serrato-dentations of two sizes, posterior face with numerous small adpressed dentations; anterior femora distinctly longer than the coxæ, rather slender, slightly arcuate, external margin with five (or four) spines, internal margin with fourteen or fifteen spines of alternating large and small size, discoidal spines four in number; anterior tibiae slightly less than half the length of the femora, armed externally with eleven and internally with fourteen spines. Median limbs considerably shorter than the posterior pair, both with no distinct femoral lobes: tibiae of both pairs with a distinct low dorsal premedian lobe carinations decided and sometimes sublamellate.

General color pale ochraceous, mottled and clouded (annulate or subannulate on the limbs) with prout's brown; eyes seal brown; antennæ prout's brown. Tegmina pale translucent pea green, becoming pale apple green on the opaque costal field, with median and premedian oblique brownish maculations extending over the median section of the tegmina. Wings pale naples yellow, clouded with gamboge yellow at the apex and along the costal margin, apical section with scattered minute brownish spots.

Length of body 56 mm.; length of pronotum 10; greatest width of pronotum 3.8; length of tegmen 37; length of anterior femur 11.

The type is unique.

9. *V. serraticornis* (Stål), ibidem, p. 73 (1877) (*Theoclytes*). Antioquia, Colombia.
10. *V. paraensis*, Saussure, Mém. Hist. Nat. Mex. Mant. Amér. p. 168 (1871). Brazil, Mexico, Arizona.
paraensis, Saussure & Zehntner, Biol. Centr.-Amer. Orth. Vol. 1, p. 195,
 pl. 6, f. 1, pl. 10, ff. 28, 29 (1894).
11. *V. townsendi*, Rehn, Proc. U. S. Nat. Mus. Vol. 27, p. 573 (1904). Mexico, Arizona.
12. *V. longicollis* (Stål), Bihang Svenska Vet.-Akad. Handl. Vol. 4 (10), Mexico.
 p. 74 (1877) (*Pseudovates*).
13. *V. cingulata* (1) (Drury), Illustr. Exot. Ent. Vol. 2, pl. 49, f. 2 (1773) Jamaica, Haiti, Cuba.
 (*Mantis*).
bidens, DeHaan, in Temminck, Verhandl. Natuurl. Geschied. Nederl. Overz.
 Bezitt. Zool. Orth. p. 79 (1842) (*Mantis*) (not of Fabricius, 1775).
hyalina, Fabricius, Syst. Ent. p. 277 (1775) (*Mantis*) (not of De Geer, 1773).
14. *V. annectens*, Rehn, Trans. Amer. Ent. Soc. Vol. 27, p. 85 (1900). Mexico.
15. *V. tolteca* (Saussure), Rev. Mag. Zool. (2), Vol. 11, p. 61 (1859) (*Theo-* Mexico.
clytes); Miss. Scientif. Mex. Orth. p. 291, pl. 5, ff. 3, 3a-c (1872).
16. *V. bidens* (Fabricius), Syst. Ent. p. 277 (1775) (*Mantis*). Brazil.
bidens, Saussure, Mém. Hist. Nat. Mex. Mant. Amér. p. 169, pl. 2,
 ff. 35, 35a (1871).
consobrina, Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, pl. 222 (1870) (*Pseu-*
dovates).

14. GENUS HETEROCHÆTA, WESTWOOD

Heterochæta. Westwood, Arc. Ent. Vol. 1, p. 162 (1845); Mélang. Orth. Pt. 1, p. 288, 312 (1871).

Stenovates. Saussure (2), Mélang. Orth. Vol. 2, p. 84 (1872); Saussure, Miss. Scientif. Mex. Orth. p. 286 (1872).

Characters. — Body slender, subbacilliform. Head broad, triangular; front excavate, smooth; eyes ovalo-conic, obliquely directed, with or without a non-granulose apical process; facial shield transverse; ocelli very large; antennæ short and setaceous. Pronotum elongate, subcarinate; the dilation short and weak, collar with the margins subparallel. Organs of flight elongate, in repose not attaining the apex of the abdomen; tegmina subparallel, subopaque, costal field straight; wings maculate, discoidal vein simple. Anterior limbs very long and slender; coxæ anteriorly lobate and spinose; femora slightly crassate at base, armed with long spaced spines. Median and posterior limbs moderately long; femora not lobate dorsally, ventrally supplied at the apex with two lobes; tibiæ without lobes; tarsi short. Abdomen bacilliform; supra-anal plate elongate, acute, carinate; cerci broad, lamellate.

Type of the genus : *H. tenuipes* (Westwood).

Geographical distribution of species. — Three species are known from Equatorial Africa.

1. *H. tenuipes* (Westwood), Ann. Nat. Hist. (1), Vol. 8, p. 272 (1841) Senegal, German East
 (*Toxodera*); Arc. Ent. Vol. 1, p. 162, pl. 41 (1845) (*Toxodera* [*Hetero-* Africa.
chaeta]); Revis. Ins. Fam. Mant. p. 41 (1889).
2. *H. orientalis*, Kirby, Ann. Mag. Nat. Hist. (7), Vol. 13, p. 87 (1904). East Africa.
3. *H. pantherina* (3), Saussure, Mélang. Orth. Pt. 2, p. 84, pl. 9, ff. 31-31a Egyptian Sudan, Congo.
 (1872) (*Stenovates*).
pantherina, Brunner von Wattenwyl, Ann. Mus. Stor. Nat. Genova,
 Vol. 3, p. 74 (1893) (*Stenovates*); Werner, Jahresh. Ver. Vaterl.
 Naturk. Württemberg, Vol. 62, p. 376 (1906); Griffini, Ann. Mus.
 Stor. Nat. Genova, Vol. 43, p. 417 (1907).

(1. This species has been considered to be a member of the genus *Phyllovates*, but an examination of Jamaican material shows it to be a species of *Vates*, not far removed from *V. annectens*

(2) For discussion of the status of *Stenovates* see Werner, *Jahresh. Ver. Vaterl. Naturk. Württemberg*, Vol. 62 p. 376 (1906) and Griffini, *Ann. Mus. Stor. Nat. Genova*, Vol. 43, p. 417 (1907).

(3) This species was originally recorded from Central America, but all subsequent information places its habitat in Central Africa.

15. GENUS *PSEUDUCHÆTA*⁽¹⁾, KIRBY

Pseudochæta. Kirby, Ann. Mag. Nat. Hist. (7), Vol. 13, p. 87 (1904).

Characters (2). — Eyes obtusely conical and ending in a blunt point; ocelli very prominent. Pronotum slightly expanded above the anterior coxæ and with the lateral margins denticulate throughout. Anterior coxæ slightly curved, attenuate beyond the middle and slightly expanded again before the extremity, front lateral carina with about six moderately large teeth; anterior femora half as long again as the coxæ, attenuate, the lower carina denticulate to the base; anterior tibiæ slender, not more than half as long as the femora, outer carina with six spines including the terminal one, inner carina with a great number of curved spines which gradually increase in length and terminate in an immense curving hook about two-fifths as long as the tibiæ; anterior tarsi with the first joint slender, curved. Middle and posterior femora with rounded denticulate lateral lobes; middle femora and tibiæ short and attenuate in the middle, all the carinæ very finely denticulate, femora with an inner and tibiæ with an outer terminal spine; posterior femora and tibiæ long, rather slender, of nearly equal length, all the carinæ very finely denticulate, femora with an inner terminal spine, tibiæ with an inner and outer one. Cerci jointed and lamellate.

Geographical distribution of species. — A single species is known from West Africa.

1. *P. strachani*, Kirby, Ann. Mag. Nat. Hist. (7), Vol. 13, p. 88 (1904). Lagos, West Africa.

16. GENUS *SEVERINIA*, FINOT

Severinia. Finot, Ann. Soc. Ent. Belg. Vol. 46, p. 433 (1902).

Characters. — Body greatly elongate, slender, weakly subspinose in the female. Head triangular, vertex not produced behind the eyes, occiput obtuse; eyes globose, in the female the apex terminates in a short subcylindrical obtuse spine; ocelli strong, little distant, placed in a triangle, their plane being perpendicular to the surface on which they are placed, the inferior placed a little below the insertion of the antennæ; antennæ of the male simple, of the female unknown. Pronotum elongate, much longer than the anterior coxæ, the part posterior to the transverse sulcus slightly more than three times as long as the anterior part, rounded anteriorly, margins denticulate; supracoxal dilation not strong; median longitudinal carina very distinct, the apex being a heart shaped tubercle. Tegmina abbreviate, in the male reaching the sixth abdominal segment, in the female not reaching the third; costal field irregularly reticulate. Wings marked with purplish black. Anterior coxæ not lobate, the base and dorsal margin at the apex not dilated; anterior femora beneath with the internal margin in the female armed with alternately large and small spines, in the male with equal spines, external margin with four spines, discoidal spines four in number, three in a longitudinal series; anterior tibiæ beneath with the external margin spinulose. Median and posterior femora and tibiæ carinate above, median and posterior limbs not lobate; posterior tarsi with the first two joints slightly longer than the remaining joints together. Supra-anal plate transverse, apex rotundate; cerci ovate, broad, flat and foliate.

(1) This genus, the type of which has apparently remained unique since described, is closely related to *Heterochæta*; in fact it is difficult to find any character in the original description to separate it from the latter genus. There exists in the author's mind a strong suspicion that the two are inseparable, but it appears preferable to let the name stand for the present as a valid genus, although the diagnosis contains little in the way of differential characters.

(2) Known only from the female.

Geographical distribution of species. — A single species is known from the Algerian Sahara region.

1. *S. lemoroi*, Finot, Bull. Soc. Ent. Fr. 1893, p. 29 (1893) (*Heterochæta*); Ann. Soc. Ent. Fr. Vol. 64, p. 97 (1895) (*Heterochæta*); ibidem, Vol. 65, pl. 14, ff. 10-12 (1896); Ann. Soc. Ent. Belg. Vol. 46, p. 432 (1902). Biskra and Tillis, Algerian Sahara.

17. GENUS HETEROCHÆTULA, WOOD-MASON

Heterochætula. Wood-Masson, Journ. Asiat. Soc. Bengal, Vol. 58, Pt. 2, p. 308 (1889).

Characters. — Sexes alike. Body small, delicate, long, slender, bacilliform. Head transverse, depressed, nearly horizontal, pentagonal; vertex much produced above the level of the eyes, distinctly divided by notches and grooves into five lobes, a median, two submedian, and two lateral; middle of vertex concave, convex or truncate; eyes compressed, laterally very salient, with a short simple or a bifid non-faceted corneal spine at the upper and outer angle; facial shield a transverse band deeply indented by the antennæ and not very distinctly defined basally, and concave apically; on each side a small tubercle is placed between the antennal scrobe and the eye. Pronotum transversely convex, traversed from the base to beyond the middle of the anterior lobe by a fine raised median line; margins very finely toothed; disk very minutely and sparsely granulose. Cerci short, broadly foliaceous. Organs of flight colored. Tegmina with the veinlets of the costal field long and very oblique and rarely branched and anastomosed so as to form a reticulum with very long and narrow meshes; median vein simple; anal vein not quite reaching the margin; axillary vein reaching the margin. Wings with the anterior area narrow; discoidal vein simple. Anterior coxæ above depressed and unarmed; anterior femora armed below on the outer edge with four spines (order of length two, one, three, four), on the inner edge with thirteen or fourteen alternately shorter and longer ones, and bearing four discoidal spines; anterior tibiæ blunt tectate. Posterior limbs without foliaceous lobes, but provided with genicular spines; lateral genicular lobes of the feebly quadricristate femora short or acuminate produced; tibiæ filiform, terete above, feebly bicristate below; first joint of tarsi not longer than the next two taken together.

Type of the genus : *H. fissispinis*, Wood-Mason.

Geographical distribution of species. — Two species are known from the Indian subregion of the Oriental region.

1. *H. tricolor* (Wood-Mason), Ann. Mag. Nat. Hist. (4), Vol. 18, p. 441 (1876) (*Heterochæta*); Journ. Asiat. Soc. Bengal, Vol. 58, Pt. 2, p. 309 (1889). Bengal and Orissa, India.
2. *H. fissispinis*, Wood-Mason, Journ. Asiat. Soc. Bengal, Vol. 58, Pt. 2, p. 309 (1889). Mysore, India.

18. GENUS PARADANURIA, WOOD-MASON

Paradanuria. Wood-Mason, Ann. Mag. Nat. Hist. (4), Vol. 19, p. 220 (1877); Journ. Asiat. Soc. Bengal, Vol. 58, p. 314 (1889).

Characters. — Body elongate, delicate; integument granulose and longitudinally coarsely pauci-rugose. Head depressed, horizontal, deeper than broad, rather broader than the prothorax at its dilation; vertex with its lateral lobes produced above and slightly outwards over the eyes into blunt tubercles, median lobe on the disk elevated into a huge convex boss which is separated anteriorly or inferiorly by a transverse sulcus from the subquadrate ocellar eminence, the latter bearing a blunt

conical tubercle at the middle of its posterior margin; eyes compressed, rectangulate with a stout bluntly mammilliform non-faceted corneal spine at the angle. Pronotum tectate with distinctly rounded dilation and a longitudinal median carina which is continuous to the apex of the abdomen. Tegmina narrow, elongate, more or less subhyaline, tessellate, striolate or guttate with brownish or yellowish. Wings hyaline, costa and apex frequently colored. Supra-anal plate of female broader than long, triangular. Cerci of female foliaceous, extending beyond the subgenital plate of the abdomen by the greater portion of their length, widening from the base to the apex, which is divided by a shallow notch into two points. Anterior limbs long and slender; coxæ expanded along the apical fourth of their anterior crest into a conspicuous dentate foliaceous lobe; femora nearly straight, weakly arched below, with acute genicular lobes and a conspicuous supragenicular lobe, armed below on the outer margin with six spines, on the inner with a more numerous alternating series, discoidal spines three in number; tibiæ as broad as deep, above terete, straight and of uniform width. Posterior limbs very short; femora stout, very slightly fusiform, prismatic, with four strong crests and accessory ridges, the posterior ventral crest foliaceous, genicular and supragenicular lobes long, slender, no genicular spines present; tibiæ rather longer than the femora, above terete, below bicristate; first joint of tarsi not quite so long as the combined length of the three succeeding joints.

Type of the genus : *P. orientalis*, Wood-Mason.

Geographical distribution of species. — Three species are known from the Indian sub-region of the Oriental region and the Australian region.

1. *P. orientalis*, Wood-Mason, Ann. Mag. Nat. Hist. (4), Vol. 19, p. 220 (1889). Bangalore and Mysore, India.
orientalis, Westwood, Revis. Ins. Fam. Mant. p. 41, pl. 12, f. 9 (1889).
2. *P. parvula*, Westwood, ibidem, p. 41 (1889) (*Toxodera* [*Paradanuria*]). Habitat unknown.
3. *P. fortunei* (1), Westwood, ibidem, p. 41, pl. 8, f. 7 (1889) (*Toxodera* [*Paradanuria*]). North Australia?

19. GENUS EUTHYPHLEPS WOOD-MASON

Euthypheps. Wood-Mason, Journ. Asiat. Soc. Bengal, Vol. 58, Pt. 2, p. 315 (1889).

Characters. — Female sex alone known. Body long, rather delicate, bacilliform. Integument granulose and spinulose, especially on the prothorax. Head rather depressed; vertex slightly declivent, its median lobe separated from the submedian lobes by two longitudinal depressions of the disk, the latter triangularly produced posteriorly and dorsally so as to form an occipital cavity for the reception of the anterior end of the pronotum; ocelli large, on a considerable prominence, which bears a spike-like erect tooth at the middle of its posterior margin and is separated from the vertex by a transverse groove; eyes narrow, oval, convex laterally, produced dorsally and armed at the upper and outer angle with a large stout blunt, somewhat curved digitiform non-faceted corneal spine. Pronotum tectate, with a distinct median carina which is continued to the apex of the abdomen. Abdominal segments with the ventral faces produced posteriorly, the first to seventh produced in the middle into a delicate filamentous process, the last into a broadly concavo-truncate triangle with arcuate sides. Cerci broadly foliaceous, thirteen-jointed, broadest at the antepenultimate segment, the dorsal angle of the last four segments produced so that the dorsal margins are bluntly dentate, apices bifid. Organs of flight extending nearly to the apex of the abdomen. Tegmina semi-opaque, subcoriaceous, subequal; costal field irregularly reticulate; anterior branch of discoidal vein simple and unbranched, posterior branch of discoidal vein

(1) This species does not appear from the figure to be congeneric with *P. orientalis*, but no specimens have been seen by us.

with six rami; axillary vein quadri-ramose, the first and second rami paralleling the margin, the third and fourth traversing the anal fold. Wings hyaline, except along the anterior margin and at the apex; apex blunt and not markedly produced; anal emargination slight, obtuse-angulate; discoidal vein forked at two-thirds its length from the base. Anterior limbs long and slender; anterior coxæ expanded for fully the apical third of their anterior crest into a conspicuous dentate foliaceous lobe; anterior femora narrow, slightly sinuate dorsally, the apex produced into a supragenicular spine, outer margin with five spines, inner margin with eleven, discoidal spines three in number; anterior tibiæ straight, paucispinose, terete above. Posterior legs long and slender, carinate and lobate and furnished with curved acicular genicular spines longer than the genicular lobes, the lateral ones of which are longer than the dorsal.

Geographical distribution of species. — A single species is known from the Himalayan subregion of the Oriental region.

1. *E. rectivenis*, Wood-Mason, Journ. Asiat. Soc. Bengal, Vol. 58, Pt. 2, Kangra, Himalayas, p. 317 (1889).

20. GENUS *ÆTHALOCHROA*, WOOD-MASON

***Æthalochroa*.** Wood-Mason, Ann. Mag. Nat. Hist. (4), Vol. 19, p. 308 (1877); Journ. Asiat. Soc. Bengal, Vol. 58, p. 310 (1889).

***Arsacia*.** Stål, Bihang Svenska Vet.-Akad. Förh. Vol. 4 (10), p. 70 (1877).

***Arsaria*.** Brunner von Wattenwyl, Ann. Mus. Stor. Nat. Genova, Vol. 33, p. 74 (1893).

***Arteria*.** Kirby, Syn. Cat. Orth. Vol. 1, p. 308 (1904).

Characters. — Sexes alike. Body greatly elongate, bacilliform. Head not wider than the dilation of the pronotum, rather higher than broad; occiput concave; vertex divided by grooves into five lobes, two lateral, which are conoidally produced, two submedian, which are not always produced, and one median lobe which is a low transversely convex elevation of considerable extent, terminating abruptly immediately above and behind the ocelli, sometimes produced on the median line in a simple or bifid horn; ocular margins of the forehead with a small spiniform tubercle; ocelli large, placed on a triangular tubercle; eyes higher than broad, strongly prominent, tumid, and furnished dorso-laterally with a conical non faceted spine or at least a vestige of the same; facial shield pentagonal, dorsal margin slightly produced in the middle; antennæ short, setaceous. Pronotum greatly elongate, granulose, strongly tectate with a distinct continuous median carina in the female and a mesially interrupted one in the male; shaft slightly bowed; supracoxal dilation large, rotund-angulate; lateral carinæ sharply granulose. Second to sixth abdominal segments carinate ventrally, seventh or eighth emarginate ventrally; dorsum of the abdomen longitudinally carinate; cerci broadly foliaceous, spatulate, rounded or rotund-ato-truncate at the apex. Organs of flight when closed hardly extending beyond the fifth abdominal segment; marginal areas subcoriaceous, semi-opaque; posterior areas membranous and hyaline; tegmina with the basal third of the costal field rather sharply dilated and covered with dense, sharply defined and prominent polygonal reticulations; wings with unbranched discoidal vein and a distinct anal emargination. Anterior coxæ triquetrous, their carinæ, especially the posterior, granuloso-spinulose, the anterior expanded at the apex into a short foliaceous lobe; femora with their dorsal margin concave, cristate at the apex, their ventral margins armed externally with five spines and internally with twelve to fourteen alternately shorter and longer spines, discoidal spines three in number; tibiæ weak, curved, slightly enlarged toward either end from the thin median section, terete dorsally, except for a faint crest distally, paucispinose, being armed only on the apical fifth of external margin and on the apical half of internal margin, terminal claw long and rather abruptly hooked. Posterior limbs rather short, strongly

carinate; femora without genicular spines, the four carinæ expanded into foliaceous lobes or spinulose, genicular lobes short, submucronate, trigonal; tibiæ equal to or a trifle longer than the femora, with one dorsal and two ventral carinæ, the latter with foliaceous lobes or the tibiæ are fusiform in shape; first tarsal joint short, about as long as the two succeeding joints together.

Type of the genus : *Æ. ashmoliana* (Westwood).

Geographical distribution of species. — Three species are known from the Indian and Ceylonese subregions of the Oriental region.

1. *Æ. ashmoliana* (Westwood), Ann. Nat. Hist. (1), Vol. 8, p. 272 (1841) Bengal, Madras, Ceylon.
(*Vates*); Arc. Ent. Vol. 2, p. 52, note (1845) (*Vates*).
ashmoliana, Saussure, Mélang. Orth. Pt. 1, p. 309 (1871) (*Popa?*); Wood-Mason, Ann. Mag. Nat. Hist. (4), Vol. 19, p. 310 (1877); Westwood, Revis. Ins. Fam. Mant. p. 46, pl. 12, f. 6 (1889).
var. simplicipes, Wood-Mason, Proc. Zool. Soc. Lond. p. 584 (1878). Bombay.
var. insignis, Wood-Mason, ibidem, p. 584 (1878). North India.
2. *Æ. affinis*, Wood-Mason, Journ. Asiat. Soc. Bengal, Vol. 58, p. 313 (1889). Sind, India.
3. *Æ. spinipes*, Wood-Mason, ibidem, p. 313 (1889). Sind, India.

21. GENUS PSEUDEMPUSA, BRUNNER VON WATTENWYL

Pseudempusa. Brunner von Wattenwyl, Ann. Mus. Stor. Nat. Genova, Vol. 33, p. 75 (1893).

Characters. — Head large, broad; vertex straight, compressed, front impressed; antennæ very short, setaceous. Pronotum slender, longer than the anterior coxæ, triangularly produced above the insertion of the latter; margins entirely eroso-dentate. Tegmina not reaching the apex of the abdomen; apex obtuse. Wings rounded; discoidal vein furcate near the base, enclosing a large field with an extensive ocelliform spot. Anterior coxæ spinulose ventrally, dorsal margin granulose; anterior femora slender, unguicular sinus placed beyond the middle, internal margin armed with unequal spines, discoidal spines four in number, the third the largest; anterior tibiæ, aside from the claw, with seven spines on the external margin. Median and posterior limbs not lobate. Abdomen dilated, but not lobate. Supra-anal plate of female triangular; cerci of female terete.

Geographical distribution of species. — A single species is known from the Oriental region.

1. *P. pinna-pavonis*, Brunner von Wattenwyl, Ann. Mus. Stor. Nat. Genova, Vol. 33, p. 75, t. 2, f. 25 (1893); Observ. Color. Ins. p. 5, pl. 4, f. 50 (1897). — Plate, Fig. 3. Burma.

22. GENUS MACRODANURIA, SJÖSTEDT

Macrodanuria. Sjöstedt, Bihang Svenska Vet.-Akad. Handl. Vol. 25, Afd. 4, no. 6, p. 22, pl. f. 1, 2 (1900).

Characters. — Body very narrow and elongate, bacilliform. Head trigonal, much broader than high, the eyes very large, protuberant and hemispherical; occiput with three pair of tubercles, the lateral ones higher than all the others although but short, blunt, subtrigonal tubercles, the median pair of tubercles extremely weak and low; facial shield transverse, subobtuse-angulate dorsally. Pronotum very long and thin, forming about two-fifths the entire length; supracoxal dilation distinct but not large, its margin rounded, all the lateral pronotal margins rather sparsely spined; surface of the pronotum sparsely and irregularly granoso-tuberculate; median carina distinct but weak. Tegmina and wings of female very short, not exceeding the metanotum, of male much more

ample. Abdomen bacilliform, slightly expanded distally, median segments with their apical margins supplied with foliaceous frills; supra-anal plate (♀) transverse subquadrate, margin bilobate; cerci (♀) blunt, depressed, fusiform. Anterior limbs with their lateral faces granoso-tuberculate; anterior coxæ about two-fifths the length of the pronotum, the distal expansion rather long and low and with its margin weakly serrato-dentate; anterior femora slightly longer than the coxæ, slightly bowed dorsally about a third the length from the distal extremity, tapering, strongly granoso-tuberculate on the proximal two-fifths of the ventral margin, distally armed with four spines on the external and with a much more numerous (thirteen or fourteen) series of unequal and irregularly disposed spines on the internal margin, discoidal spines four (1) in number; anterior tibiæ short, with seven spines on the external margin and thirteen or fourteen on the internal margin. Median limbs moderately elongate, strongly carinate; femora with a dorsal and a ventral lobe near the apex, tibiæ with a similar premedian pair. Caudal limbs very slender and elongate, carinate, not lobed.

Type of the genus : *M. phasmoides*, Sjöstedt.

Geographical distribution of species. — Two species are known from Equatorial Africa.

1. *M. phasmoides*, Sjöstedt, Bihang Svenska Vet.-Akad. Handl. Vol. 25, French Congo. Afd. 4, no. 6, p. 23, pl. ff. 1, 2 (1900).
2. *M. elongata* (De Borre). Ann. Soc. Ent. Belg. Vol. 27, p. 76 (1883) Southern Guinea. (*Danuria*).

23. GENUS DANURIA, STÅL

Danuria. Stål, Oefv. Vet.-Akad. Forh. Vol. 13, p. 169 (1856); Vol. 28, p. 387 (1871); Bihang Svenska Vet.-Akad. Handl. Vol. 4, no. 10, p. 70 (1877); Karsch, Ent. Nachr. Vol. 15, p. 270 (1889); Werner, Jahresb. Ver. Vat. Nat. Württemberg, Vol. 62, p. 374 (1906); Sjöstedt, Wissensch. Ergebn. Schwed. Zool. Exped. Kilimandjaro, Pt. 17, Orth. p. 72 (1909).

Daniura. Saussure, Mitt. Schweiz. Ent. Ges. Vol. 3, p. 70 (Lapse for *Danuria*) (1869).

Characters. — Body considerably elongate, slender, subequal. Head compressed; eyes protuberant, elongate-ovate, attenuate dorsally; occiput above each eye produced into a decided auriculate acute lobe, the intervening portion of the occiput emarginato-truncate and on its anterior face bearing four tubercles divided by sulci; facial shield transverse, obtuse-angulate dorsally; antennæ of male elongate, moniliform, of female short. Pronotum slender, subequal, supracoxal dilation very slight; anterior margin obliquely emarginate laterally, truncate mesially; lateral margins entirely spinose or granulose; median carina distinctly but not strongly marked. Tegmina and wings very ample in the male and reaching almost to the apex of the abdomen, quite short in the female, covering but a very small portion of the abdomen. Abdomen elongate; supra-anal plate of male transverse, subbilobate; cerci of male blunt terete. Limbs elongate, slender, anterior pair sparsely granulose, median and posterior pairs strongly carinate, not lobate. Anterior coxæ not less than half the length of the pronotum, the posterior face considerably granulose, distal expansion decided, angulate and with its margin serrato-dentate, median constriction pronounced; anterior femora exceeding the coxæ in length, slender, straight, distal portion with four spines on the external and twelve on the internal margins, discoidal spines four in number; anterior tibiæ with seven or eight spines externally and eleven or twelve internally; proximal joint of the tarsi over half again as long as the remaining joints united. Median and posterior limbs not lobed, the distal portion of the posterior carina of the median femora with or without a slight dentate expansion.

(1) Sjöstedt gives but three. However, a specimen in hand shows four present on one femur and merely the stump of the fourth on the other.

Type of the genus : *D. thunbergi*, Stål.

Geographical distribution of species. — This genus is now restricted to five species inhabiting Equatorial and Austral Africa.

1. *D. thunbergi*, Stål, Oefv. Vet.-Akad. Förh. Vol. 13, p. 169 (1856). — South and East Africa, north to Mombasa, Madagascar.
Plate, Fig. 10.
thunbergi, Saussure, Mélang. Orth. Pt. 1, p. 444, pl. 7, ff. 66, 67 (1871); Karsch, Ent. Nachr. Vol. 15, p. 273 (1889).
2. *D. gracilis* (Schulthess), Ann. Mus. Stor. Nat. Genova, Vol. 39, p. 180 (1898) (*Popa*). Somaliland.
3. *D. impannosa*, Karsch, Ent. Nachr. Vol. 15, p. 274 (1889). Nubia.
4. *D. schweinfurthi*, Werner, Sitz.-Ber. Akad. Wissensch. Wien, Vol. 116, Heft 2, p. 246 (1907). Gazelle River, Soudan.
5. *D. buchholzi*, Gerstæcker, Mitt. Naturw. Ver. Vorpomm. Vol. 14, p. 93 (1883). Gold Coast, Portuguese West Africa.

24. GENUS DANURIODES, GIGLIO-TOS

Danuriodes. Giglio-Tos, Boll. Mus. Zool. Anat. Comp. Torino, Vol. 22, no. 563, p. 15 (1907).

Characters. — « Related to *Danuria* and *Macrodanuria*; differing, however, from the genus *Danuria* in the vertex having, between the elevated conical tubercles, four lower obtuse tubercles, separated by deep sulci, of which the two intermediate are the lesser, anterior coxæ with the inferior area broader, margins strongly denticulate, apical lobe shorter, intermediate femora with a preapical lobule; from the genus *Macrodanuria* in the bicornate vertex, the subovate eyes, narrowed above, anterior coxæ with the apical lobe shorter, anterior femora with four discoidal spines, intermediate tibiæ not lobate. »

Type of the genus : *D. bolauana* (Saussure).

Geographical distribution of species. — Four species from Equatorial Africa are known.

1. *D. bolauana* (Saussure), Mitt. Schweiz. Ent. Ges. Vol. 3, p. 70 (1869) Zanzibar, German and British East Africa.
(*Danuria*); Mélang. Orth. Pt. 1, p. 310 (1871) (*Danuria*).
Mantis (*Danuria*?) *superciliaris*, Gerstæcker, Arch. f. Naturg. Vol. 35, p. 210 (1869); Von der Decken's Reisen in Ost-Afrika, Vol. 3, Pt. 2, p. 15, pl. 1, ff. 7a b (1873).
Danuria? *caffra*, Westwood, Revis. Ins. Fam. Mant. p. 42, pl. 1, f. 5 (1889).
2. *D. barbozæ* (Bolivar), Jorn. Mat. Phys. Nat. Acad. Sc. Lisboa (2), Vol. 1, p. 85 (1890) (*Danuria*). Portuguese West Africa, Congo.
3. *D. serratodentata* (Karsch), Ent. Nachr. Vol. 15, p. 274 (1889) (*Danuria*). Malange (Portuguese West Africa).
4. *D. kilimandjarica* (Sjöstedt), Wissensch. Ergebn. Schwed. Zool. Exp. Kilimandjaro, Pt. 17, Orth. p. 72 (1909) (*Danuria*). [Africa].

25. GENUS POPA, STÅL

Popa. Stål, Oefv. Vet.-Akad. Förh. Vol. 13, p. 169 (1856), Bihang Svenska Vet.-Akad. Handl. Vol. 4, no. 10, p. 70 (1877); Werner, Jahresb. Ver. Vat. Nat. Württemberg, Vol. 62, p. 374 (1906); Sjöstedt, Wissensch. Ergebn. Schwed. Zool. Exp. Kilimandjaro, Pt. 17, Orth. p. 72 (1909).

Characters. — Body moderately elongate, rugose. Head trigonal; eyes quite prominent, globose; occiput with a pair of acute juxta-ocular tubercles on each side, the intervening portion truncate; postocellar region elevated into a considerable more or less rounded protuberance; facial shield

transverse, the dorsal margin subobtusely-angulate. Pronotum elongate, scabroso-tuberculate; supra-coxal dilation distinct but not large, subangulate; lateral margins serrato-dentate; shaft with a strong median carina, collar with a medio-longitudinal sulcus. Tegmina and wings very ample in the male, covering about two-thirds of the abdomen in the female; tegmina coriaceous, wings smoky. Terminal abdominal segments with a low medio-longitudinal marginal crest; supra-anal plate of female subtrigonal or transverse quadrate with the angles rounded; cerci of female moniliform. Anterior limbs robust, moderately long, scabrous; coxæ slightly less than two-thirds the pronotal length, triquetrous in section, margins serrato-granulate, the anterior margin with a distinct distal subtrigonal lobe; femora with the dorsal margin serrato-dentate and armed with a dentiform preapical lobe, lateral margin armed with four spines, internal margin armed with fourteen or fifteen spines (exclusive in each case of one in each genicular lobe); tibiæ armed externally with eight spines, internally with ten or eleven spines. Median and posterior limbs lobate (except in male of *spurca*), having on the median femora a dorsal premedian and dorsal preapical and a ventral preapical lobe, on the median tibiæ a preapical pair, in the posterior femora a minute dorsal and on the tibiæ a single preapical lobe.

Type of the genus : *P. spurca*, Stål.

Geographical distribution of species. — Five nominal species, whose relationships are imperfectly known, are found in the African and Oriental regions.

1. *P. spurca*, Stål, Oefv. Vet.-Akad. Förh. Vol. 13, p. 169 (1856); Vol. 28, no. 3, p. 387 (1871). — **Plate, Fig. 6.** South and East Africa (Cape of Good Hope to Somaliland), Madagascar.
undata (nec Fabricius), Charpentier, Orth. Descr. Depicta, pl. 38 (1841) (*Mantis*); Saussure, Mélang. Orth. Pt. 1, p. 309 (1872); Saussure & Zehntner, in Grandidier, Hist. Phys. Nat. Madagascar, Orth. Vol. 1, p. 233 (1895).
var. pallida, Saussure & Zehntner, in Grandidier, Hist. Phys. Nat. Madagascar, Orth. Vol. 1, p. 234 (1895).
2. *P. undata* (Fabricius), Ent. Syst. Vol. 2, p. 19 (1793) (*Mantis*). India, Ceylon.
undata, Werner, Ann. Mus. Zool. Acad. Imp. Sc. St. Pétersb., Vol. 13, p. 124 (1908) (*Popa*).
3. *P. servillei*, Giglio-Tos, Boll. Mus. Zool. Anat. Comp. Torino, Vol. 22, no. 569, p. 3 (1907). Cape of Good Hope, Madagascar.
Theoclytes ? undata, Serville, Hist. Nat. Ins. Orth., p. 152 (1839) (not of Fabricius).
4. *P. batesi*, Saussure & Zehntner, in Grandidier, Hist. Phys. Nat. Madagascar, Orth. Vol. 1, p. 230 (1895). Madagascar.
undata, Bates, Proc. Zool. Soc. Lond. 1863, p. 480 (1864) (part.).
5. *P. stuhlmanni*, Rehn, Ergebn. Deutsch. Cent. Afr. Exped. 1907-08, Zool., Orth. (1911). Central Africa.

26. GENUS DANURIELLA, WESTWOOD

Danuriella. Westwood, Revis. Ins. Fam. Mant. p. 42 (1889); Saussure & Zehntner, in Grandidier, Hist. Phys. Nat. Madagascar, Orth. Vol. 1, p. 235 (1895).

Characters. — Insects of very small size, sexes dissimilar. Body slender, extremely rugose. Head moderate, strongly embossed; eyes large, strongly projecting forwards; occiput much compressed, more elevated than the eyes, forming a triangular tooth on each side; facial shield transverse, the dorsal margin obtuse-angulate, the angle markedly produced anteriorly in the form of a tooth. Pronotum short, about two and a half times as long as the greatest width, granulate, carinate, denticulate on the borders, the dilation very weak, the collar short. Limbs short; anterior pair moderately strong, very rugose. Anterior coxæ not dilated into a plate at the extremity of the anterior margin;

anterior femora having the superior margin somewhat sinuate, terminating, in a strong tooth, the external margin bearing four perpendicular spines, the internal armed with four pairs of alternating large and small spines followed by two or three small spines, a large one and last two small ones; anterior tibiæ very robust, subcompressed, the inferior face concave, not sinuate dorsally, the margins regularly armed. Median limbs with the femora and tibiæ labate. Posterior femora with a small lobe; posterior tibiæ not carinulate, the superior margin bi-undulate, the extremity attenuate; metatarsi very long, cylindrical, not carinulate.

Female. — Ocelli small. Tegmina lanceolate, very short, subcoriaceous. Wings brown, semi-orbicular, the anterior field truncate. Abdomen subfusiform, very strongly rugose, bearing on the dorsum three longitudinal folds; posterior margin of dorsal segments 1 to 5 sinuate, forming on each side a rounded carinulate lobe, seventh segment with the lateral borders dilated. Supra-anal plate transverse, rounded; cerci short.

Male. — Form slender. Ocelli very large. Organs of flight elongate, hyaline, little or no coloring. Wings large, veins straight and simple. Limbs slender. Abdomen slender and very smooth.

Geographical distribution of species. — The only known species of this genus is found in the Malagasy subregion.

1. *D. irregularis*, Westwood, Revis. Ins. Fam. Mant. p. 42, pl. 1, f. 9 (1889). Madagascar.

irregularis, Saussure & Zehntner, in Grandidier, Hist. Phys. Nat. Madagascar, Orth. Vol. 1, p. 236, pl. 7, ff. 6, 7 (1895).

27. GENUS PHITRUS, KARSCH

Phitrus. Karsch, Ent. Nachr. Vol. 18, p. 149 (1892); Berl. Ent. Zeitschr. Vol. 39, p. 279, pl. 20, f. 8 (1894).

Characters. — Female sex alone known. Form slender, elongate. Head transverse, depressed, not bi-auriculate lobate; eyes rounded; antennæ very slender, moderately long. Pronotum linear, nearly two and one-half times the length of the anterior coxæ; above the coxal insertion slightly expanded and there nearly twice the width of the base of the pronotum; entire lateral margins subserrato-granulose. Tegmina and wings squamiform, wings colored. Limbs slender, moderately long; anterior coxæ with the posterior margin serrulate; anterior femora little longer than the coxæ, beneath on the external margin with four spines exclusive of the apical one, on the internal margin with fourteen spines, discoidal spines four in number; anterior tibiæ beneath armed with ten spines on the external margin and thirteen or fourteen on the internal margin; median and posterior femora with a preapical lobe in addition to the genicular ones; posterior tibiæ not carinate above.

Geographical distribution of species. — A single species is known from Tropical Africa.

1. *P. lobulipes*, Karsch, Ent. Nachr. Vol. 18, p. 149 (1892); Berl. Ent. Zeitschr. Vol. 39, p. 279, pl. 20, f. 8 (1894). Cameroon, West Africa.

28. GENUS JALLA, GIGLIO-TOS

Jalla. Giglio-Tos, Boll. Mus. Zool. Anat. Comp. Torino, Vol. 23, no. 563, p. 13 (1907).

Characters. — Head broad; eyes considerably prominent, internal margin sinuate, sub-reniform; facial shield much broader than long, the superior margin bisinuate in bracket (}) form; ocelli large and disposed in a triangulate, approximate; vertex behind ocelli with a transverse arcuate

sulcus, by the eyes granulose, in the middle behind the sulcus bigranulose, summit of the vertex truncate in the middle and on each side by the eye elevated into a conic tubercle with mucronate apex. Pronotum oval, little longer than broad, anterior, posterior and lateral margins rotundate, narrowed posteriorly, armed upon lateral margins with numerous triangular spines, disk strongly granose, on the prozona an elevated tumescence limited by a circular sulcus is present, the tumescence armed on each side with a longitudinal series of three large very acute granules; portion of the pronotum posterior to the transverse sulcus strongly medio-longitudinally sulcate, two low rounded tubercles placed before the posterior margin (♂) or with an additional median pair of the same (♀). Tegmina in male much longer than the abdomen, elliptical, apex acute, densely venose, subhyaline; in female short ovate, reaching only to the middle of the abdomen, coriaceous, costal and humeral sub-tuberculate. Wings hardly longer than the tegmina, tessellate. Limbs carinate, pilose. Anterior coxæ hardly longer than the pronotum, robust, triquetrous, internal face granulose, inferior margin spinose; anterior femora somewhat incrassate, the external face granose in the middle, the margins distinctly carinate, the internal margin with thirteen spines besides the apical, external margin with five spines including the apical, discoidal spines four in number; anterior tibiæ robust, dorsal margin arcuate, ciliate, armed exteriorly with six, internally with nine spines. Median and posterior femora dorsally and ventrally carinate, armed with a genicular spine; median and posterior tibiæ carinate.

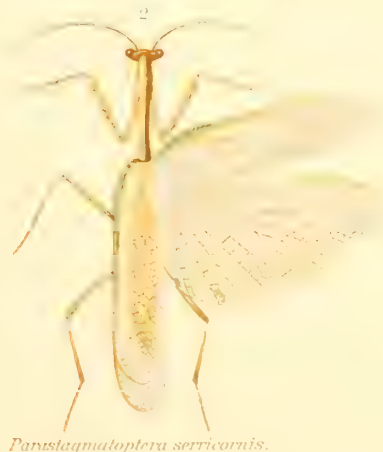
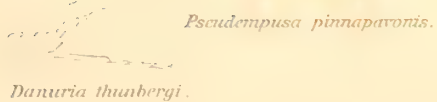
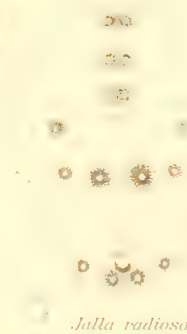
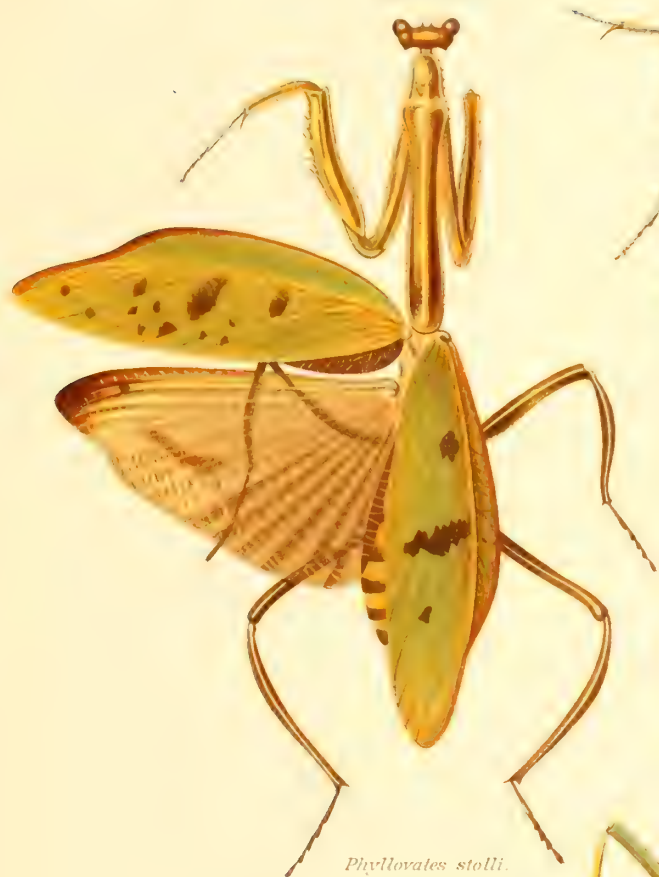
Geographical distribution of species. — A single species is known from Tropical Africa.

1. *J. radiosa*, Giglio-Tos, Boll. Mus. Zool. Anat. Comp. Torino, Vol. 22. Upper Zambesi.
no. 563, p. 14 (1907). — **Plate, Fig. 8, 9.**

EXPLANATION OF PLATE

Figures 1-7 and 10 natural size, 8, 9 and 11 twice natural size

- Fig. 1. *Cardioptera brachyptera* (Burmeister), ♂.
2. *Parastagmatoptera serricornis*, Kirby, ♂.
— 3. *Pseudempusa pinna-pavonis*, Brunner von Wattenwyl, ♀ (after Brunner von Wattenwyl).
4. *Zoolea lobipes* (Olivier), ♀.
— 5. *Stagmatoptera supplicaria*, Burmeister, ♀.
— 6. *Poça spurca*, Stål, ♀.
— 7. *Phyllovates stollii* (Saussure & Zehntner), ♀.
— 8. *Jalla radiosa*, Giglio-Tos, dorsum of pronotum of ♀.
— 9. *Jalla radiosa*, Giglio-Tos, lateral outline of pronotum of ♀.
— 10. *Danuvia thunbergi*, Stål, anterior limb of ♂.
— 11. *Oxyopsis lobeler*, Rehn, head of ♀ (after Rehn).



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